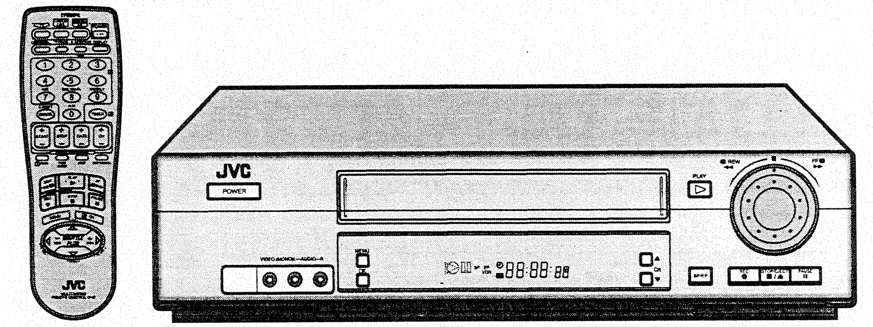
JVC

# SERVICE MANUAL

## VIDEO CASSETTE RECORDER

# HR-VP68U/VP680U/VP780U



VHS
Hi-Fi
SQPB
VCR plus+ ®
C3 CABLE BOX CONTROL

## SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-VP780U)*

### GENERAL

| | |
|---|---|
| Power requirement | : AC 120 V∿ , 60 Hz |
| Power consumption | |
| Power on | : 19 W |
| Power off | : 2.5 W |
| Temperature | |
| Operating | : 5°C to 40°C (41°F to 104°F) |
| Storage | : –20°C to 60°C (–4°F to140°F) |
| Operating position | : Horizontal only |
| Dimensions (W x H x D) | : 400 x 94 x 281 mm<br>(15-3/4" x 3-3/4" x 11-1/8") |
| Weight | : 3.2 kg (7.1 lbs) |
| Format | : VHS NTSC standard |
| Maximum recording time | |
| SP | : 210 min. with ST-210 video cassette |
| EP | : 630 min. with ST-210 video cassette |

### VIDEO/AUDIO

| | |
|---|---|
| Signal system | : NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields |
| Recording/ Playback system | : DA-4 (Double Azimuth) head helical scan system |
| Signal-to-noise ratio | : 45 dB |
| Horizontal resolution | : 230 lines (VHS) |
| Frequency range | |
| Normal audio | : 70 Hz to 10,000 Hz |
| Hi-Fi audio | : 20 Hz to 20,000 Hz |
| Input/Output | : RCA connectors (IN x 2, OUT x 1) |

### TUNER

| | |
|---|---|
| Tuning system | : Frequency-synthesized tuner |
| Channel coverage | |
| VHF | : Channels 2–13 |
| UHF | : Channels 14–69 |
| CATV | : 113 Channels |
| RF output | : Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced |

### TIMER

| | |
|---|---|
| Clock reference | : Quartz |
| Program capacity | : 1-year programmable timer/ 8 programs |
| Memory backup time | : Approx. 3 min. |

### ACCESSORIES

| | |
|---|---|
| Provided accessories | : RF cable (F-type),<br>Infrared remote control unit, "AA" battery x 2 |

*Specifications shown are for SP mode unless specified otherwise.*
*E. & O.E. Design and specifications subject to change without notice.*

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**The following table lists the differing points between Models ( HR-VP68U/U(C), HR-VP680U/U(C) and HR-VP780U/U(C) ) in this series.**

| | HR-VP68U/U(C) | HR-VP680U/U(C) | HR-VP780U/U(C) |
|---|---|---|---|
| JOG/SHUTTLE | NOT USED | NOT USED | USED |
| FRONT PANEL COLOR | DARK GRAY | BLACK | BLACK |
| FOOT LINE | GOLD | – | GOLD |
| FDP COLOR | AMBER | BLUE WHITE | BLUE WHITE |
| VCR PLUS+ | VCR+C3 | VCR+ | VCR+C3 |
| CABLE/DBS BOX CTL | USED | NOT USED | USED |
| PAUSE/AV COMPU TERMINAL | USED | NOT USED | USED |
| CABLE BOX TERMINAL | USED | NOT USED | USED |
| REAR AUDIO/VIDEO INPUT | USED | NOT USED | USED |

# Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## ● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   **Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

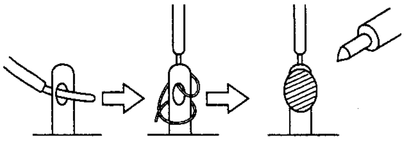


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

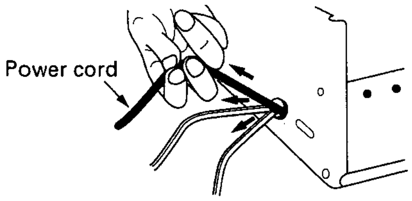


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

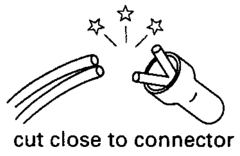


Fig.3

       (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

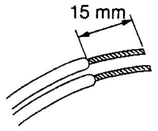


Fig.4

       (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

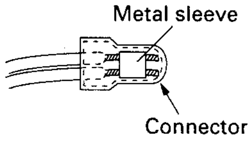


Fig.5

       (4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

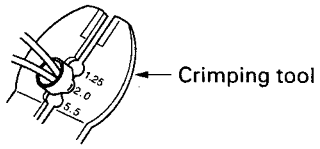


Fig.6

       (5) Check the four points noted in Fig.7.

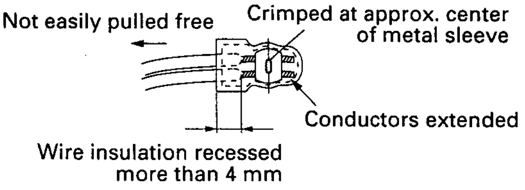

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

# ● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

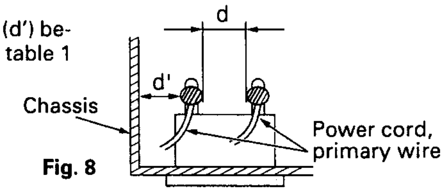


**Fig. 8**

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   **Measuring Method :** (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

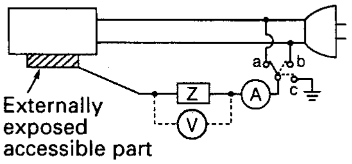


**Fig. 9**

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   **Measuring Method:**
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

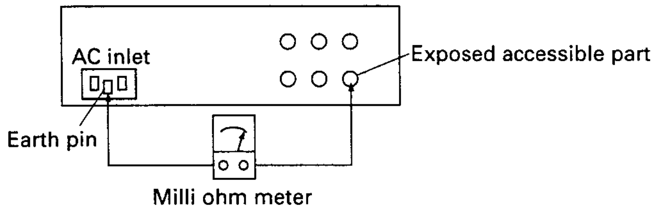


**Fig. 10**

**Grounding Specifications**

| Region | Grounding Impedance (Z) |
|---|---|
| USA & Canada | Z ≦ 0.1 ohm |
| Europe & Australia | Z ≦ 0.5 ohm |

| AC Line Voltage | Region | Insulation Resistance (R) | Dielectric Strength | Clearance Distance (d), (d') |
|---|---|---|---|---|
| 100 V | Japan | R ≧ 1 MΩ/500 V DC | AC 1 kV 1 minute | d, d' ≧ 3 mm |
| 100 to 240 V | | | AC 1.5 kV 1 miute | d, d' ≧ 4 mm |
| 110 to 130 V | USA & Canada | 1 MΩ ≦ R ≦ 12 MΩ/500 V DC | AC 1 kV 1 minute | d, d' ≧ 3.2 mm |
| 110 to 130 V<br>200 to 240 V | Europe & Australia | R ≧ 10 MΩ/500 V DC | AC 3 kV 1 minute (Class II)<br>AC 1.5 kV 1 minute (Class I) | d ≧ 4 mm<br>d' ≧ 8 mm (Power cord)<br>d' ≧ 6 mm (Primary wire) |

**Table 1** Specifications for each region

| AC Line Voltage | Region | Load Z | Leakage Current (i) | a, b, c |
|---|---|---|---|---|
| 100 V | Japan | 1 kΩ | i ≦ 1 mA rms | Exposed accessible parts |
| 110 to 130 V | USA & Canada | 0.15 μF<br>1.5 kΩ | i ≦ 0.5 mA rms | Exposed accessible parts |
| 110 to 130 V<br>220 to 240 V | Europe & Australia | 2 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Antenna earth terminals |
| | | 50 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Other terminals |

**Table 2** Leakage current specifications for each region

**Note:** These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

**Dear Customer,**
Thank you for purchasing the JVC VHS video cassette recorder. Before use, please read the safety information and precautions contained in the following pages to ensure safe use of your new VCR.

# CAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

## WARNING:
## TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

### CAUTION:
This video cassette recorder should be used with AC 120V∿, 60Hz only.
To prevent electric shocks and fire hazards, DO NOT use any other power source.

### CAUTION:
TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

### ATTENTION:
POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

### Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

### CAUTION:
Changes or modifications not approved by JVC could void user's authority to operate the equipment.

**Declaration of Conformity**
**Model Number** :HR-VP780U
**Trade Name** :JVC
**Responsible Party** :JVC Americas Corp.
**Address** :1700 Valley Road Wayne, N.J. 07470
**Telephone Number** :973-315-5000

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Failure to heed the following precautions may result in damage to the VCR, Remote or video cassette.**

1. **DO NOT place the VCR . . .**
   ... in an environment prone to extreme temperatures or humidity.
   ... in direct sunlight.
   ... in a dusty environment.
   ... in an environment where strong magnetic fields are generated.
   ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the VCR's ventilation openings.**
3. **DO NOT place heavy objects on the VCR or on the Remote.**
4. **DO NOT place anything which might spill on the top of the VCR or on the Remote.**
5. **AVOID violent shocks to the VCR during transport.**

VCR Plus+C$^3$ and PlusCode are registered trademarks of Gemstar Development Corporation.
The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

DSS™ is an official trademark of DIRECTV, Inc., a unit of GM Hughes Electronics. PRIMESTAR is a registered service mark of Primestar Partners, L.P. DISH Network™ is a trademark of Echostar Communications Corporation.

- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SQPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- As an ENERGY STAR® Partner, JVC has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

# IMPORTANT PRODUCT SAFETY INSTRUCTIONS

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This product has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

### ATTENTION:
Follow and obey all warnings and instructions marked on your product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this product and keep this booklet for future reference.

## INSTALLATION

### 1. Grounding or Polarization
(A) Your product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.
If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
(B) Your product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature.
If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

### 2. Power Sources
Operate your product only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. If your product is intended to operate from battery power, or other sources, refer to the operating instructions.

### 3. Overloading
Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

### 4. Power Cord Protection
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

### 5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.
- Do not block the openings by placing the product on a bed, sofa, rug or other similar surface.
- Do not place the product in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

### 6. Wall or Ceiling Mounting
The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

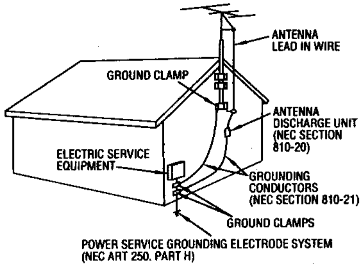
## ANTENNA INSTALLATION INSTRUCTIONS

### 1. Outdoor Antenna Grounding
If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding connectors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

### 2. Lightning
For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

### 3. Power Lines
An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

**EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70**


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250. PART H)

**NEC – NATIONAL ELECTRICAL CODE**

## USE

**1. Accessories**

To avoid personal injury:

- Do not place this product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the product.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the product.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

**2. Product and Cart Combination**

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

PORTABLE CART WARNING
(Symbol provided by RETAC)

**3. Water and Moisture**

Do not use this product near water—for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

**4. Object and Liquid Entry**

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

**5. Attachments**

Do not use attachments not recommended by the manufacturer of this product as they may cause hazards.

**6. Cleaning**

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

**7. Heat**

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

## SERVICING

**1. Servicing**

If your product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

**2. Damage Requiring Service**

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the product.
c. If the product has been exposed to rain or water.
d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e. If the product has been dropped or damaged in any way.
f. When the product exhibits a distinct change in performance—this indicates a need for service.

**3. Replacement Parts**

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

**4. Safety Check**

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

## HOW TO USE THIS INSTRUCTION MANUAL

- The Index on pages 53 – 56 lists frequently-used terms, and the number of the page on which they are used or explained in the manual. This section also illustrates the controls and connections on the front and rear panel, the front display panel and the Remote.
- The ☞ mark signals a reference to another page for instructions or related information.
- Operation buttons necessary for the various procedures are clearly indicated through the use of illustrations at the beginning of each major section.

## BEFORE YOU INSTALL YOUR NEW VCR . . .

**. . . please read the sections/literature listed below.**

- "CAUTIONS" on page 2
- "IMPORTANT PRODUCT SAFETY INSTRUCTIONS" on the previous pages

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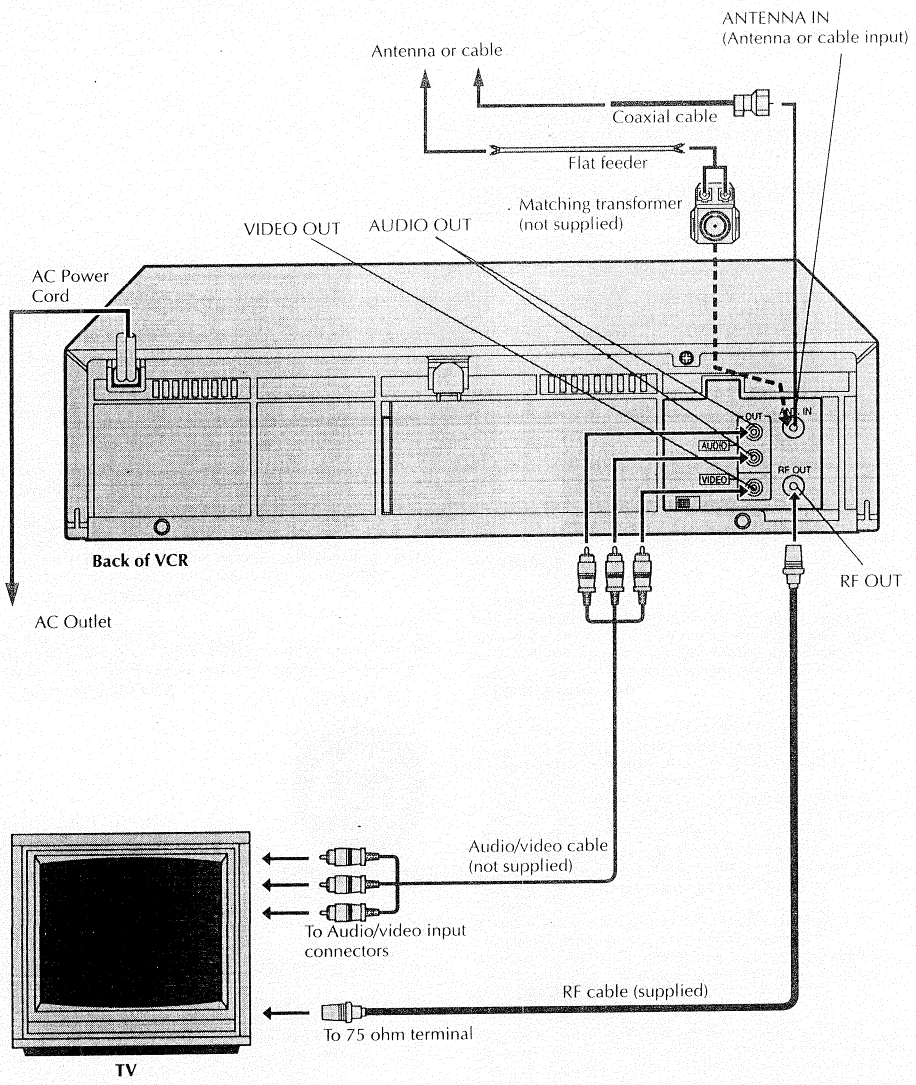
# Basic Connections


ANTENNA IN
(Antenna or cable input)
Antenna or cable
Coaxial cable
Flat feeder
Matching transformer
(not supplied)
VIDEO OUT
AUDIO OUT
AC Power
Cord
OUT
AUDIO
VIDEO
ANT. IN
RF OUT
Back of VCR
AC Outlet
RF OUT
Audio/video cable
(not supplied)
To Audio/video input
connectors
RF cable (supplied)
To 75 ohm terminal
TV

## 1 Check contents

Make sure the package contains all of the accessories listed in "SPECIFICATIONS" (☞ pg. 57).

## 2 Situate VCR

Place the VCR on a stable, horizontal surface.

## 3 Connect VCR to TV

The following connections are required.

**RF Connection**

❶ Disconnect the TV antenna from the TV.

❷ Connect the TV antenna cable to the ANT. IN terminal on the rear of the VCR.

❸ Connect the supplied RF cable between the RF OUT terminal on the rear of the VCR and the TV's antenna input terminal.

**AV Connection** (improves picture quality during tape playback.)

*If your TV is equipped with audio/video input connectors*

❶ Connect the antenna, VCR and TV as shown in the illustration.

❷ Connect an audio/video cable between the AUDIO/VIDEO OUT connectors on the rear of the VCR and the audio/video input connectors on the TV.

## 4 Connect VCR to power source

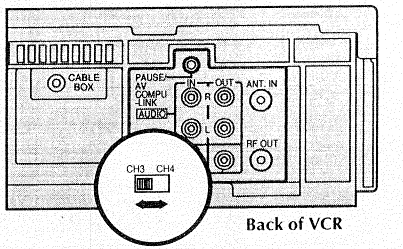
Connect the AC power plug to an AC outlet.

- The clock and tuner channels will automatically be set when the antenna is connected and when the AC power cord is first connected to an AC power outlet (☞ pg. 8).
(If "Auto" or "CH" is displayed on the front display panel before the VCR is turned on, the clock and tuner channels are being set automatically. Wait until the clock time is displayed on the front display panel before turning on the VCR.)

## 5 Final preparation for use

Turn on the VCR and set the CH3-CH4 switch on the rear (shown below) to either CH3 or CH4 correctly.

- The CH3–CH4 switch is preset to the CH3 position.
Set to CH4 if CH3 is used for broadcasting in your area. (To view the picture from this VCR through this channel, select the same channel on the TV with the CH3–CH4 switch setting on the VCR.)
- You can now perform basic playback (☞ pg. 21) or basic recording (☞ pg. 25).


CABLE BOX
PAUSE/ AV COMPU -LINK
AUDIO
IN
OUT
R
L
ANT. IN
RF OUT
CH3 CH4

**Back of VCR**

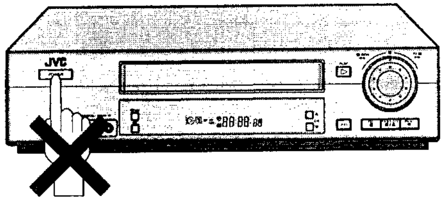
*NOTES:*

- *The VCR channel is the channel on which you can watch the picture from the VCR on the TV when only using the RF connection. The VCR's CH3-CH4 switch, on the back of the VCR, sets the VCR channel to CH3 or CH4.*
- *Even if you are using audio/video cables to connect your VCR to your TV, you must also connect it using the RF cable. This will ensure that you can record one show while watching another (☞ pg. 26).*
- *For full identification of the VCR's rear panel, refer to the Index (☞ pg. 55).*

# Plug & Play Setting

## Auto Clock Set/Auto Tuner Set

**ATTENTION**
- If you use a cable box, Plug & Play will not function; set the clock and tuner channels separately. (☞ pg.10 – 14)
- It takes several minutes for the VCR to complete the Plug & Play setting.
- Do not press any buttons on the front panel or on the Remote while Plug & Play is in progress.

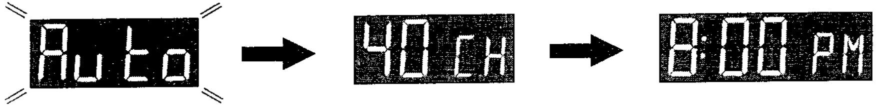


This VCR sets the clock and tuner channels automatically when AC power cord is first connected to an AC outlet. The antenna cable must be connected for the Plug & Play setting.
The time and date can be set automatically by the clock setting data transmitted from one of the regular TV broadcast channels. We call this TV channel the "host channel" and it is a PBS channel in your area.

### 1 Perform Plug & Play setup

**Connect the antenna cable to the VCR (☞ pg. 6). Then connect the AC power cord to an AC outlet. Do not turn on the VCR.**
The clock and tuner channels will be set automatically.

*NOTES:*
- *Auto Clock Set is performed first.*
  *"Auto" blinks on the front display panel during Auto Clock Set.*
- *Auto Channel Set is performed next. Auto Channel Set scans all the channels that are receivable by your VCR. During Auto Channel Set, the channel numbers are displayed as they are scanned and set.*
- *When Plug & Play setting has been complete successfully, the correct clock time is displayed. If you perform Plug & Play setting successfully, there is no need to perform the clock (☞ pg. 10) and tuner (☞ pg. 13) settings. If, however, you want to add or delete channels, refer to Manual Channel Set on page 14.*



**During Initial Auto Clock Set**
"Auto" blinks.

**During Auto Channel Set**
The channel numbers are displayed as they are scanned and set.

**Plug & Play Completed**
The current time (including AM/PM) is displayed.

* **If an incorrect clock time or "– –:– –" appears on the display panel, see "What to do if Plug & Play setting failed" below.**

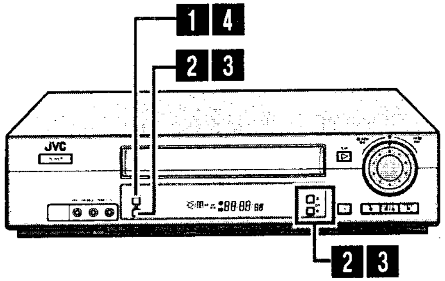
**INFORMATION**
- If "AUTO CLOCK" is set to "ON" on the Clock Set screen on page 11, the clock will be adjusted automatically by the host channel every hour (except 11:00 PM, midnight, 1:00 AM and 2:00 AM) using the incoming PBS channel clock setting data. (This automatic clock adjustment can only be performed when the VCR is turned off. The clock will be adjusted just on these hours — on the time displayed on the front panel display, not on the actual real time.)
  The default setting of "AUTO CLOCK" is "ON".
- If the memory backup fails, because a power outage occurs or because the AC power cord is unplugged, Plug & Play will be performed when power is restored to the VCR.

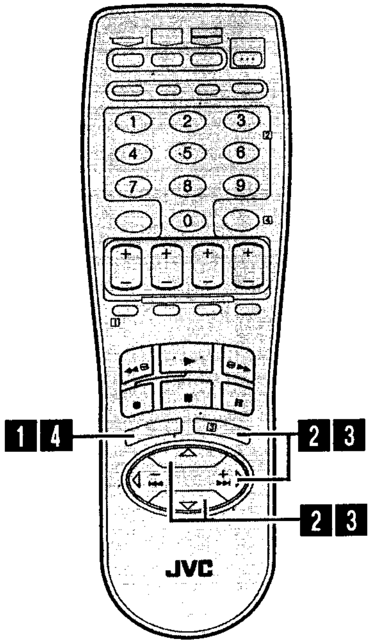
**What to do if Plug & Play setting failed**
- If an incorrect time is displayed on the front display panel, you may be receiving the clock setting data of a PBS channel from an adjacent time zone, or an incorrect PBS channel from a cable TV system. In this case, perform the Semiauto (☞ pg. 11) or Manual Clock Set (☞ pg. 12) procedure.
- If "- -:- -" appears on the front display panel, your antenna cable may not be connected to the VCR or there may not be a Host PBS signal available in your area. Ensure that the antenna cable is connected correctly. Then turn on and off the VCR; the Plug & Play setting will be automatically reactivated.
  If Plug & Play setting is not performed though the antenna cable is connected correctly, perform Manual Clock Set (☞ pg. 12) and Auto Channel Set or Manual Channel Set (☞ pg. 13 or 14).

---

# Language Setting

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





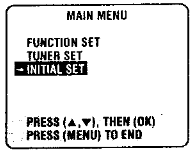
This VCR offers you the language choice to view menus and some messages (excluding the on-screen display superimposed on the TV screen) — in English, Spanish or French.
Select the desired language using the following procedure.
The default setting is "ENGLISH".

### 1 Access Main Menu screen

Press **MENU**.

### 2 Access Initial Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "INITIAL SET", then press **OK**.


MAIN MENU

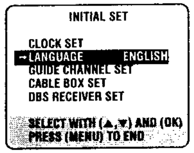
FUNCTION SET
TUNER SET
→ INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 3 Select language

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "LANGUAGE", then press **OK** repeatedly until the desired language is selected.


INITIAL SET

CLOCK SET
→ LANGUAGE ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

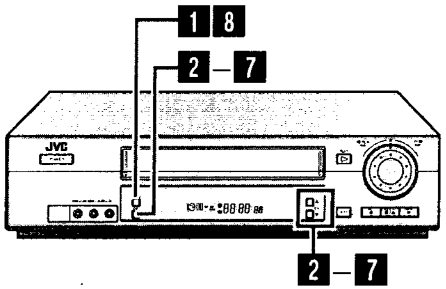
**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "LANGUAGE", then press **OK** or **SHUTTLE PLUS** ▷ repeatedly until the desired language is selected.

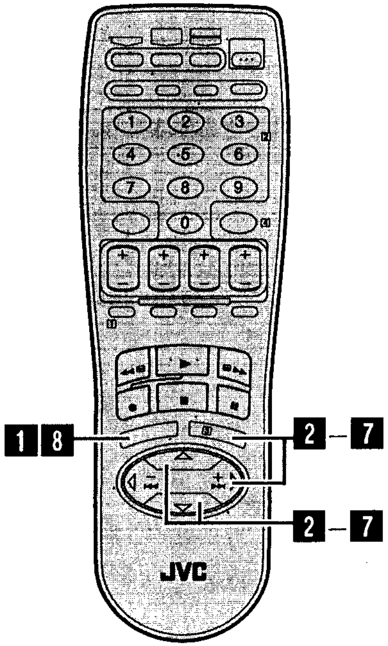
### 4 Return to normal screen

Press **MENU**.

# Clock Setting

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





Perform clock setting only if the clock has not been set correctly by the Plug & Play setting or if you use a cable box.
Access the Clock Set screen to perform the Semiauto or Manual Clock Set. Each procedure starts from step 4 after preparation steps below are finished.
If you use a cable box, set the clock manually. (☞ pg. 12)

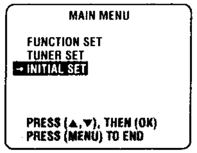
## Preparations

### 1 Access Main Menu screen

Press **MENU**.

### 2 Access Initial Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "INITIAL SET", then press **OK**.

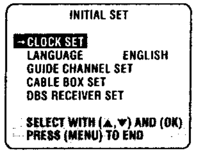


```
MAIN MENU

FUNCTION SET
TUNER SET
→ INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 3 Select clock set

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "CLOCK SET", then press **OK**.



```
INITIAL SET

→ CLOCK SET
LANGUAGE          ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "CLOCK SET", then press **OK** or **SHUTTLE PLUS** ▷.

- "CABLE BOX USERS SET CLOCK MANUALLY" appears on the screen for about 5 seconds, then the Clock Set screen appears.

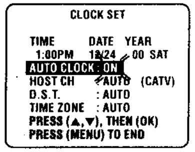
## Setting clock semiautomatically

### — Semiauto Clock Set

You can change the host channel/D.S.T. /time zone setting manually.
First follow steps 1 to 3 on page 10, then go to the following steps.

### 4 Set Auto Clock to ON

**On the front panel:**
Press **CH▲▼** to move the highlight bar to "AUTO CLOCK", then press **OK** so that "ON" is selected.



```
CLOCK SET

TIME        DATE   YEAR
 1:00PM     12/24  00 SAT
AUTO CLOCK : ON
HOST CH     : AUTO  (CATV)
D.S.T.      : AUTO
TIME ZONE   : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar to "AUTO CLOCK", then press **OK** or **SHUTTLE PLUS** ▷ so that "ON" is selected.
Then;
To select the host channel — go to step 5.
To select the D.S.T. mode — go to step 6.
To select the time zone — go to step 7.

*NOTE:*

*The time that has been set previously will be erased when "AUTO CLOCK", "HOST CH", "D.S.T." or "TIME ZONE" setting is changed.*

### 5 Select host channel

You can either select "AUTO" or enter a PBS channel number.

**On the front panel:**
Press **CH▲▼** to move the highlight bar to "HOST CH", then press **OK** repeatedly until "AUTO" or the desired PBS channel number is selected.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar to "HOST CH", then press **OK** or **SHUTTLE PLUS** ▷ until "AUTO" or the desired PBS channel number is selected.

*NOTE:*

*Some PBS channels do not transmit clock setting data.*

### 6 Select D.S.T. mode

You have three choices:

| | |
|---|---|
| **AUTO**– | Select if you want to adjust your VCR's clock automatically by the incoming signal from the host channel. (Auto Daylight Saving Time*) |
| **ON**– | Adjustment will be made by the clock itself. |
| **OFF**– | Select when Daylight Saving Time does not apply to you. |

**On the front panel:**
Press **CH▲▼** to move the highlight bar to "D.S.T.", then press **OK** repeatedly until the desired setting is selected.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar to "D.S.T.", then press **OK** or **SHUTTLE PLUS** ▷ repeatedly until the desired setting is selected.

### 7 Select time zone

You can select the time zone automatically or manually.

**On the front panel:**
Press **CH▲▼** to move the highlight bar to "TIME ZONE", then press **OK** repeatedly until "AUTO" or the desired time zone is selected.
Each time you press the button, the time zone changes as follows:

→ AUTO→ ATLANTIC→ HAWAII→ EASTERN
→ ALASKA → CENTRAL PACIFIC
→ MOUNTAIN → (back to the beginning)

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar to "TIME ZONE", press **OK** or **SHUTTLE PLUS** ▷ repeatedly until "AUTO" or the desired time zone is selected (see above).

*NOTE:*

*If an incorrect clock time is displayed by the Plug & Play setting, you may be receiving the clock setting data of a PBS channel from an adjacent time zone or from an incorrect PBS channel from a cable TV system. If you selected "AUTO" for the host channel in step 6, be sure to select the correct time zone manually.*

### 8 Return to normal screen

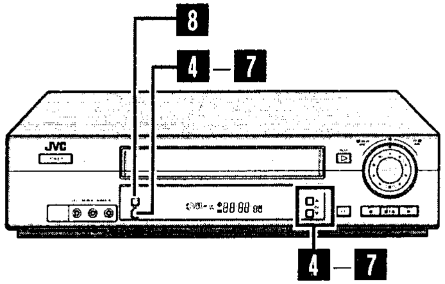
Press **MENU**.

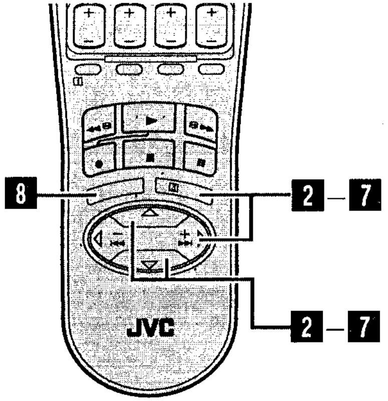
*** Auto Daylight Saving Time**

*This function enables automatic adjustment of the VCR's clock at the start and end of Daylight Saving Time.*
*With Auto DST activated, . . .*
*. . . on the first Sunday of April at 2:00 AM, the clock is adjusted to 3:00 AM.*
*. . . on the last Sunday of October at 2:00 AM, the clock is adjusted to 1:00 AM.*

**IMPORTANT**

*Turn off the VCR after performing Semiauto Clock Set. "Auto" will appear on the front display panel while the clock is being set. The current clock time will appear automatically when the clock setting is complete.*





## Setting clock manually

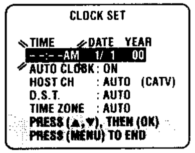
### — Manual Clock Set

First follow steps 1 to 3 on page 10, then go to the following steps.

### 4 Set time

**On the front panel:**
Press **CH▲▼** until the desired time appears, then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ until the desired time appears, then press **OK** or **SHUTTLE PLUS** ▷.



```
CLOCK SET

TIME          DATE   YEAR
- -:- -AM     1/ 1   00
AUTO CLOCK : ON
HOST CH    : AUTO  (CATV)
D.S.T.     : AUTO
TIME ZONE  : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

- Holding **CH ▲▼** or **SHUTTLE PLUS** △▽ changes the time in 30-minute intervals.
- When the time is entered manually, "AUTO CLOCK" is automatically set to "OFF", and "HOST CH" and "TIME ZONE" disappear.

### 5 Set date

**On the front panel:**
Press **CH▲▼** until the desired date appears, then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ until the desired date appears, then press **OK** or **SHUTTLE PLUS** ▷.

- Holding **CH ▲▼** or **SHUTTLE PLUS** △▽ changes the date in 15-day intervals.

### 6 Set year

**On the front panel:**
Press **CH▲▼** until the desired year appears, then press **OK** twice.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ until the desired year appears, then press **OK** or **SHUTTLE PLUS** ▷ twice.

### 7 Select D.S.T. mode

You can select either "ON" or "OFF".

**ON**– Adjustment will be made by the built-in clock itself.

**OFF**– Select when Daylight Saving Time does not apply to you.

**On the front panel:**
Press **CH▲▼** to select the desired setting.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to select the desired setting.

### 8 Start clock

Press **MENU** and normal screen appears.

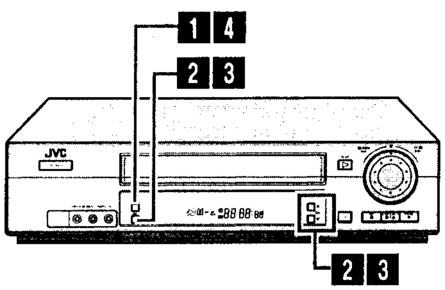
**To make corrections any time during the process**

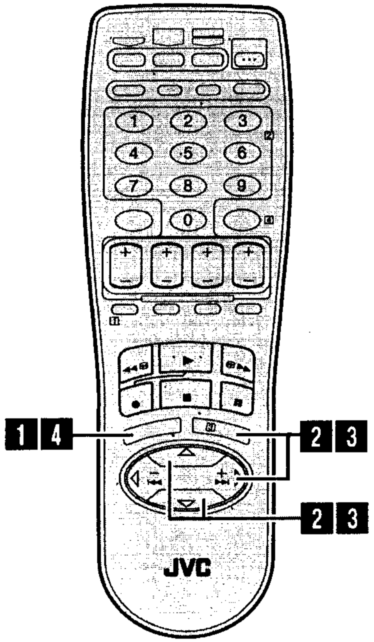
Press **OK** or **SHUTTLE PLUS** ▷ repeatedly until the item you want to change blinks, then press **CH ▲▼** or **SHUTTLE PLUS** △▽.

---

# Tuner Setting

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





## Setting channels automatically — Auto Channel Set

Use Auto Channel Set only if channels have not been set correctly by the Plug & Play setting or if you use a cable box. If you want to add or delete channels, use Manual Channel Set (☞ pg. 14).

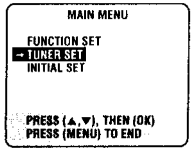
### 1 Access Main Menu screen

Press **MENU**.

### 2 Access Tuner Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "TUNER SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "TUNER SET", then press **OK** or **SHUTTLE PLUS** ▷.



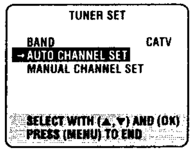
```
MAIN MENU

FUNCTION SET
→ TUNER SET
INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

### 3 Perform Auto Channel Set

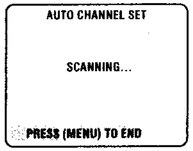
You can automatically set the receivable channels in your area in the order of their frequencies.

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "AUTO CHANNEL SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "AUTO CHANNEL SET", then press **OK** or **SHUTTLE PLUS** ▷.



```
TUNER SET

BAND                 CATV
→ AUTO CHANNEL SET
MANUAL CHANNEL SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```



```
AUTO CHANNEL SET

SCANNING...

PRESS (MENU) TO END
```

*NOTES:*

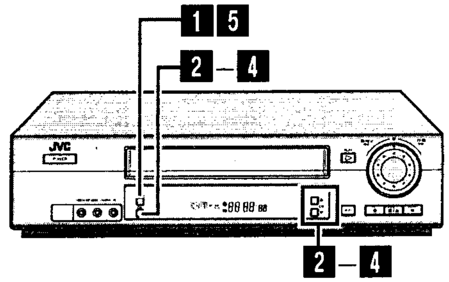
- *When Auto Channel Set is complete, "SCAN COMPLETED" appears on screen.*
- *If the scan was unsuccessful, "SCAN COMPLETED– NO SIGNAL" appears on screen. Check the connections and start again.*

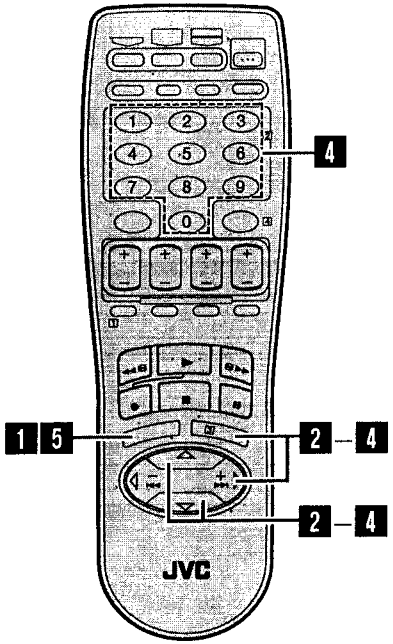
### 4 Return to normal screen

Press **MENU**.

**INFORMATION**

The VCR selects the correct band (TV or CATV) automatically during Auto Channel Set.
The selected band will be displayed on the right side of "BAND" on the Tuner Set screen.





## Setting channels manually

### — Manual Channel Set

You can add the channels you want or delete the channels you do not want manually.

### 1 Access Main Menu screen

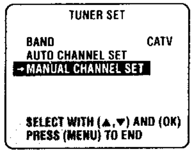
Press **MENU**.

### 2 Access Tuner Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "TUNER SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "TUNER SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 3 Access Manual Channel Set screen



TUNER SET

BAND CATV
AUTO CHANNEL SET
→MANUAL CHANNEL SET

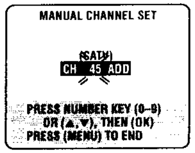
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

**On the front panel:**
Press **CH▲▼** move the highlight bar (arrow) to "MANUAL CHANNEL SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "MANUAL CHANNEL SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 4 Add or skip desired channels

To add channels



MANUAL CHANNEL SET

(SAT#)
CH 45 ADD

PRESS NUMBER KEY (0–9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

**On the Remote ONLY:**
❶ Press the **Number** keys to input a channel number you want to add.
❷ Press **OK** or **SHUTTLE PLUS** ▷ to set to "ADD".
❸ Repeat ❶ and ❷ to add other channels.

To skip channels

**On the front panel:**
❶ Press **CH▲▼** to select a channel number you want to skip.
❷ Press **OK** to set to "SKIP".
❸ Repeat ❶ and ❷ to skip other channels.

**On the Remote:**
❶ Press the **Number** keys or **SHUTTLE PLUS** △▽ to input a channel number you want to skip.
❷ Press **OK** or **SHUTTLE PLUS** ▷ to set to "SKIP".
❸ Repeat ❶ and ❷ to skip other channels.

### 5 Return to normal screen

Press **MENU**.

---

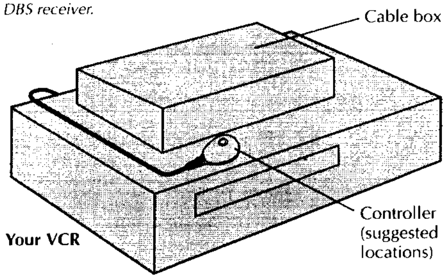
# Cable Box Control Setting

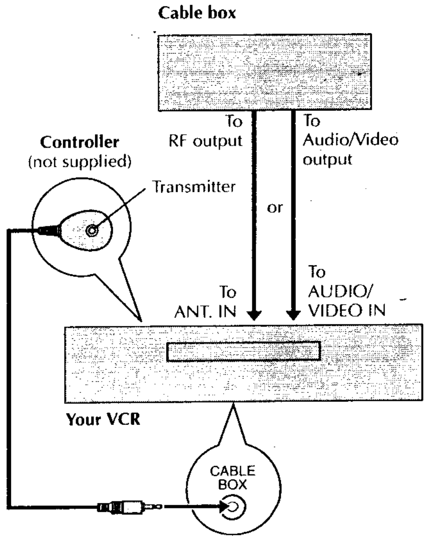
### Suggested location

Place the cable box on top of the VCR. Attach the VCR's Controller to the top of the VCR with the Controller's transmitter pointed towards the cable box's remote sensor.

*ATTENTION:*

*The Controller can also control a DBS receiver. If both a cable box and a DBS receiver are used, position the Controller so its signal reaches the remote sensors on both the cable box and DBS receiver.*





The following procedure is required if you receive your TV channels through a cable box (descrambler). The Controller allows the VCR to automatically switch the cable box channel during timer recording. The Controller is effective for recording broadcasts that have been programmed using VCR Plus+ (☞ pg. 30) or Express timer programing (☞ pg. 34).

*NOTE:*

*The Controller is not supplied with this unit. It can be requested by mailing in the completed JVC Cable Mouse Certificate that is included with the accessory package.*

## Installing Controller

### 1 Situate Controller

Place the Controller so that its transmitter is facing the cable box's remote sensor.

- Make sure the path between the Controller and the cable box's remote sensor is not blocked.

### 2 Attach Controller

Fix securely using the adhesive strip attached on the back of the Controller.

### 3 Connect cable box to VCR

- ***If your cable box does not have audio/video input connectors***
  Connect the RF output terminal on the cable box to the ANT. IN terminal on the rear of your VCR.
- ***If your cable box has audio/video input connectors***
  Connect an audio/video cable between the AUDIO/VIDEO IN connectors on the rear of the VCR and the audio/video output connectors on the cable box.

*NOTE:*

*When connecting your cable box, refer to its instruction manual.*

### 4 Connect Controller to VCR

Connect the Controller to the CABLE BOX Controller connector on the rear panel.

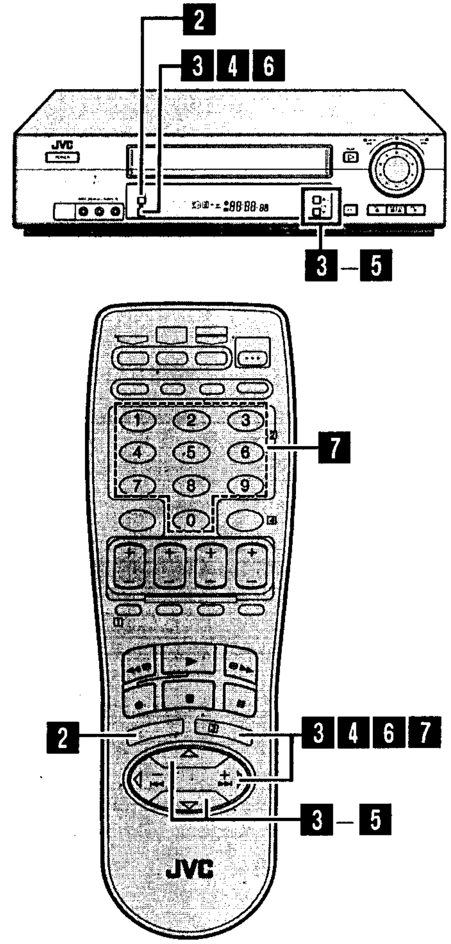
**How to control the cable box**

This VCR has two separate methods to control your cable box.

- The VCR's wireless Remote can control your cable box. This eliminates the need for a separate cable box's Remote.
- The VCR's Controller can also control your cable box. This allows the VCR to change your cable box's channel number during timer recording.

Each method must be set up separately. To set up the VCR's Remote, refer to page 46. To set up the Controller, go to page 16.

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.



## Setting cable box output channel & brand

After installation, set the cable box output's channel and its brand correctly; otherwise, the Controller cannot work correctly.

### 1 Turn on cable box

Select a channel other than channel 9 on your cable box.

### 2 Access Main Menu screen on VCR

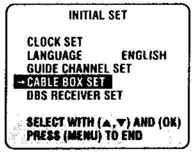
Press **MENU**.

### 3 Access Initial Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "INITIAL SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 4 Access Cable Box Set screen



INITIAL SET

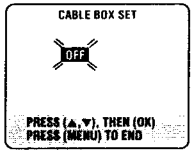
CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
→CABLE BOX SET
DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "CABLE BOX SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "CABLE BOX SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 5 Select cable box output channel



CABLE BOX SET

OFF

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

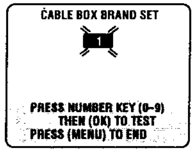
Your selection depends on how your cable box is connected to your VCR.

- **If your cable box is connected to your VCR's ANT. IN terminal on the rear**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until the channel number representing the cable box's output (CH2 – CH9) appears on the screen.
- **If your cable box is connected to your VCR's AUDIO/VIDEO IN connectors on the front panel**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "ON F-1 (FRONT)" appears on the screen.
- **If your cable box is connected to your VCR's AUDIO/VIDEO IN connectors on the rear panel**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "ON L-1 (REAR)" appears on the screen.
- **If you do not use a cable box**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "OFF" appears on the screen.

### 6 Access Cable Box Brand Set screen

Press **OK**.

### 7 Enter cable box brand

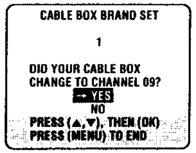


CABLE BOX BRAND SET

1

PRESS NUMBER KEY (0–9)
THEN (OK) TO TEST
PRESS (MENU) TO END

**On the Remote ONLY:**
Press the appropriate **Number** keys to enter the brand code from the list shown to the right, then press **OK**.



CABLE BOX BRAND SET

1

DID YOUR CABLE BOX
CHANGE TO CHANNEL 09?
→ YES
NO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

- **If the cable box's channel changes to 9, setting is complete**
  Press **OK** and "CABLE BOX CONTROL IS ON" appears on the screen for about 5 seconds, then it returns to the normal screen.
- **If the cable box's channel does not change to 9**
  ① Press **SHUTTLE PLUS** △▽ (or **CH ▲▼** on the front panel) to move the highlight bar (arrow) to "NO".
  ② Press **OK**.
  ③ Repeat step 7 until the cable box's channel changes to 9 by entering another code.
  ④ If the channel does not change after going through all the code numbers listed for your model of cable box, then try all the other numbers between 1 and 25.

**If the VCR's clock has not been set (with AUTO CLOCK set to ON)**
"CABLE BOX USERS SET CLOCK MANUALLY" appears for about 5 seconds when you press **OK** in step 6, then the Clock Set screen appears.
Perform Manual Clock Set on page 12. If you press **MENU** after the clock has been set, the Cable Box Brand Set screen appears.

**CABLE BOX BRAND LIST**

| BRAND | CODE |
|---|---|
| ARCHER | 1, 5, 17 |
| CABLETENNA | 1, 17 |
| CABLEVIEW | 15, 16, 17, 21, 25 |
| CITIZEN | 15, 16, 17, 21, 25 |
| CURTIS | 2, 8 |
| DIAMOND | 1, 17 |
| EASTERN | 19 |
| GC BRAND | 15, 16, 17, 21, 25 |
| GEMINI | 15 |
| GENERAL INSTRUMENTS | 1, 4, 6, 11, 12, 15, 28 |
| HAMLIN | 10, 18, 19, 23 |
| JASCO | 15 |
| JERROLD | 1, 4, 6, 11, 12, 15, 28 |
| NOVAVISION | 2, 8 |
| OAK | 7, 20 |
| PANASONIC | 13, 14 |
| PULSER | 15, 16, 17, 21, 25 |
| RCA | 13, 14 |
| REGAL | 10, 18, 19, 23 |
| REGENCY | 19 |
| REMBRANDT | 1, 16, 17 |
| SAMSUNG | 5, 16, 24 |
| SCIENTIFIC ATLANTA | 2, 8 |
| SIGMA | 7, 20 |
| SL MARX | 5, 16, 17, 24, 25 |
| SPRUCER | 13, 14 |
| STARGATE | 5, 15, 16, 17, 21, 24, 25 |
| TELEVIEW | 5, 16, 24 |
| TOCOM | 1, 4, 16 |
| UNIKA | 1, 17 |
| UNIVERSAL | 16, 17, 25 |
| VIDEOWAY | 3, 9, 22 |
| ZENITH | 3, 9, 22 |

*NOTES:*

- *The Controller may not work with all types of cable box.*
- *If your cable box does not respond to any code between 1 and 25, you cannot use the Controller to change cable box channels. In this case, make sure to leave the cable box turned on and tuned to the proper channel before the scheduled start time of timer recording.*
  *Contact your cable company about the possibility of exchanging your current cable box with the one compatible with your VCR.*
- *The VCR can only change the cable box channel through the Controller during timer recording.*
- *If your cable box cannot be operated with a remote control (because it has no remote sensor), you cannot use the Controller to change its channels. Make sure to leave the cable box turned on and tuned to the proper channel before the scheduled start time of timer recording.*
- *If the VCR's memory backup expires because of a power failure, set the cable box output channel and brand again.*
- ***For customers in U.S.A.:** If you are unable to set the Controller, contact JVC toll free at 1-800-252-5722.*

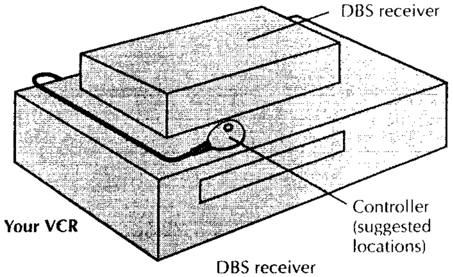
# DBS Receiver Control Setting

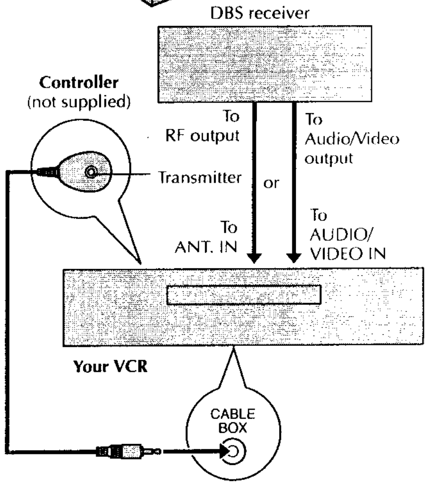
**Suggested location**

Place the DBS (Direct Broadcast Satellite) receiver on top of the VCR. Attach the VCR's Controller to the top of the VCR with the Controller's transmitter pointed towards the DBS receiver's remote sensor.

*ATTENTION:*

*The Controller can also control a cable box. If both a DBS receiver and a cable box are used, position the Controller so its signal reaches the remote sensors on both the DBS receiver and cable box.*





The following procedure is required if you receive satellite channels through a DBS (Direct Broadcast Satellite) receiver. The Controller allows the VCR to automatically switch the DBS receiver's channels during timer recording.

*NOTES:*

- *The Controller is not supplied with this unit. It can be requested by mailing in the completed JVC Cable Mouse Certificate that is included with the accessory package.*
- *The VCR can automatically change the DBS receiver channels using the Controller when the VCR has been programed using Express timer programing (☞ pg. 34). Because satellite programing does not use PlusCode, the Controller cannot change the DBS receiver channels during VCR Plus+ timer recording.*
- *If a cable box is also used, it is recommended that you connect the DBS receiver to your VCR's audio/video input connectors and the cable box to your VCR's antenna input terminal.*

## Installing Controller

### 1 Situate Controller

Place the Controller so that its transmitter is facing the DBS receiver's remote sensor.

- Make sure the path between the Controller and the DBS receiver's remote sensor is not blocked.

### 2 Attach Controller

Fix securely using the adhesive strip attached on the back of the Controller.

### 3 Connect DBS receiver to VCR

- ***If your DBS receiver does not have audio/video input connectors***
  Connect the RF output terminal on the DBS receiver to the ANT. IN terminal on the rear of your VCR.
- ***If your DBS receiver has audio/video input connectors***
  Connect an audio/video cable between the AUDIO/VIDEO IN connectors on the rear of the VCR and the audio/video output connectors on the DBS receiver.

*NOTE:*

*When connecting your DBS receiver, refer to its instruction manual.*

### 4 Connect Controller to VCR

Connect the Controller to the CABLE BOX Controller connector on the rear panel.

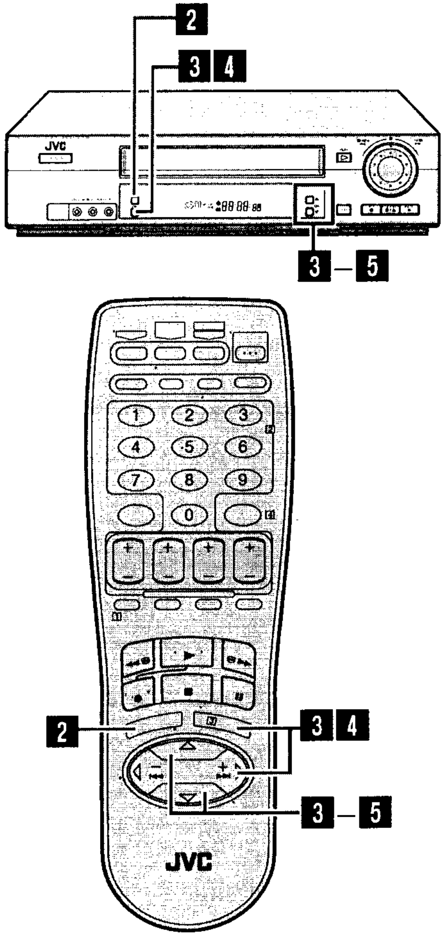
**How to control the DBS receiver**

This VCR has two separate methods to control your DBS receiver.

- The VCR's wireless Remote can control your DBS receiver. This eliminates the need for a separate DBS receiver's Remote.
- The VCR's Controller can also control your DBS receiver. This allows the VCR to change your DBS receiver's channel number during timer-recording.

Each method must be set up separately. To set up the VCR's Remote, refer to page 47. To set up the Controller, go to page 19.

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.



## Setting DBS receiver output channel & brand

After installation, set the DBS receiver's output channel and its brand correctly; otherwise, the Controller cannot work correctly.

### 1 Turn on DBS receiver

Select a channel other than channel 55, 100 or 205 on your DBS receiver.

### 2 Access Main Menu screen on VCR

Press **MENU**.

### 3 Access Initial Set screen

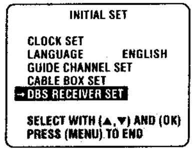
**On the front panel:**

Press **CH▲▼** to move the highlight bar (arrow) to "INITIAL SET", then press **OK**.

**On the Remote:**

Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 4 Access DBS Receiver Set screen



INITIAL SET

CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
→DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

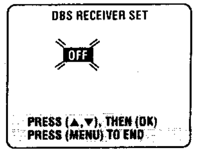
**On the front panel:**

Press **CH▲▼** to move the highlight bar (arrow) to "DBS RECEIVER SET", then press **OK**.

**On the Remote:**

Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "DBS RECEIVER SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 5 Select DBS receiver output channel



DBS RECEIVER SET

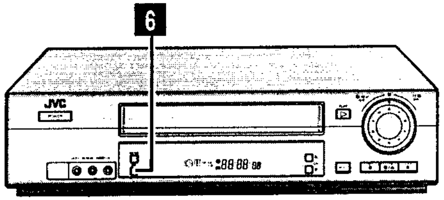
OFF

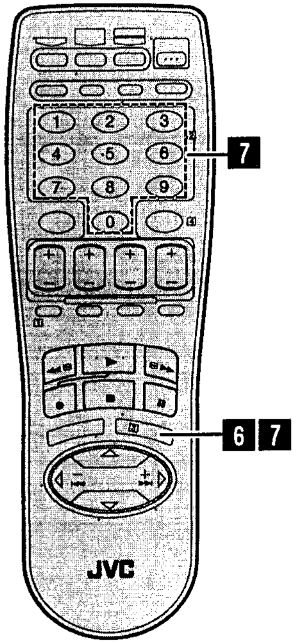
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

Your selection depends on how your DBS receiver is connected to your VCR.

- **If your DBS receiver is connected to your VCR's ANT. IN terminal on the rear**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until the channel number representing the DBS receiver's output (CH3 or CH4) appears on the screen.
- **If your DBS receiver is connected to your VCR's AUDIO/VIDEO IN connectors on the front panel**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "ON F-1 (FRONT)" appears on the screen.
- **If your DBS receiver is connected to your VCR's AUDIO/VIDEO IN connectors on the rear panel**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "ON L-1 (REAR)" appears on the screen.
- **If you do not use a DBS receiver**
  Press **CH ▲▼** on the front panel or **SHUTTLE PLUS** △▽ on the Remote until "OFF" appears on the screen.

CONTINUED ON NEXT PAGE ➡



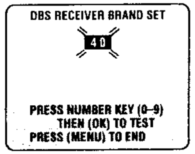


## 6 Access DBS Receiver Brand Set screen

Press **OK**.

## 7 Enter DBS Receiver's brand

**On the Remote ONLY:** Press the appropriate **Number** keys to enter the brand code from the following list, then press **OK**.
The program currently received through the DBS receiver appears for about 10 seconds.


DBS RECEIVER BRAND SET

40

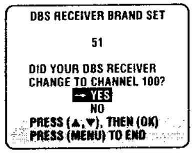
PRESS NUMBER KEY (0–9)
THEN (OK) TO TEST
PRESS (MENU) TO END

| BRAND | CODE |
|---|---|
| JVC (DISH Network) | 51 |
| ECHOSTAR (DISH Network) | 51 |
| PRIMESTAR | 50 |
| SONY (DSS) | 41 |
| RCA (DSS) | 40 |

- **If the DBS receiver's channel changes to the channel listed below for your brand, setting is complete**

  JVC → 100
  ECHOSTAR → 100
  PRIMESTAR → 55
  SONY → 205
  RCA → 205

  Press **OK** and "DBS RECEIVER CONTROL IS ON" appears on the screen for about 5 seconds, then it returns to the normal screen.


DBS RECEIVER BRAND SET

51

DID YOUR DBS RECEIVER
CHANGE TO CHANNEL 100?
→ YES
NO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

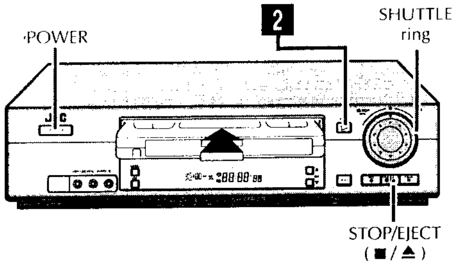
- **If the DBS receiver's channel does not change as shown above**
  ① Press **SHUTTLE PLUS** △▽ (or **CH** ▲▼ on the front panel) to move the highlight bar (arrow) to "NO".
  ② Press **OK**.
  ③ Re-enter the correct code.

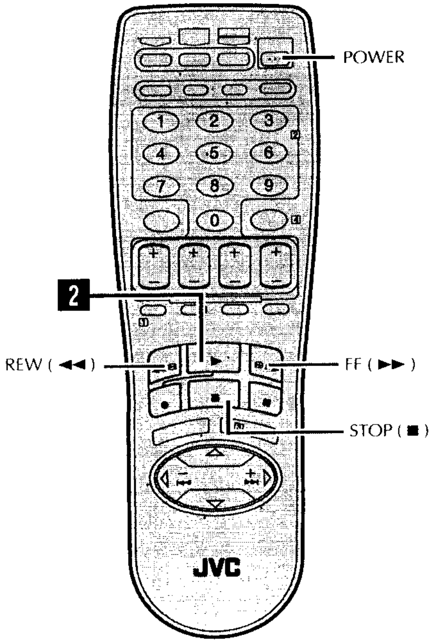
### NOTES:

- *The Controller may not work with all types of DBS receiver.*
- *If your DBS receiver does not respond to the code, you cannot use the Controller to change satellite channels. In this case, make sure to leave the DBS receiver turned on and tuned to the proper channel before the scheduled start time of timer recording.*
- *The VCR can only change the satellite channel through the Controller during timer recording.*
- *If your DBS receiver cannot be operated with a remote control (because it has no remote sensor), you cannot use the Controller to change its channels. Make sure to leave the DBS receiver turned on and tuned to the proper channel before the scheduled start time of timer recording.*
- ***For customers in U.S.A.:** If you are unable to set the Controller, contact JVC toll free at 1-800-252-5722.*

# Basic Playback

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





## 1 Load a cassette

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR.
Do not apply too much pressure when inserting.

- The VCR turns on automatically.
- The counter is automatically reset to "0:00:00".
- If the cassette's record safety tab has been removed, playback begins automatically.

## 2 Start playback

Press **PLAY ( ► )**.

- Tape speed (SP or EP) is automatically detected.

### To stop playback

Press **STOP ( ■ )** on the Remote or **STOP/EJECT ( ■ / ▲ )** on the front panel.

### To rewind the tape

Press **REW ( ◄◄ )** (or turn the **SHUTTLE** ring on the front panel to the left).

### To fast-forward the tape

Press **FF ( ►► )** (or turn the **SHUTTLE** ring on the front panel to the right).

### To eject the tape

Press **STOP/EJECT ( ■ / ▲ )** on the front panel when the tape is not running.

- You can also eject the cassette with the VCR turned off.

### To turn off the VCR

Press **POWER**.

**INFORMATION**

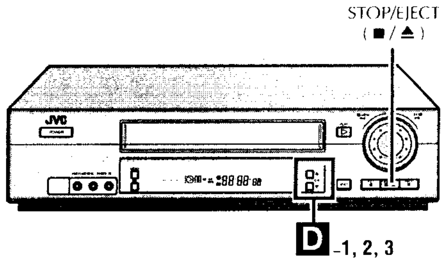
This VCR is equipped with SQPB (S-VHS QUASI PLAYBACK) that lets you watch tapes recorded in the S-VHS format with regular VHS resolution.

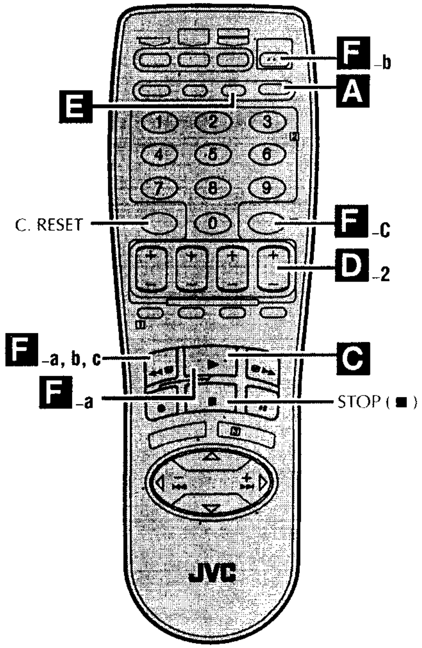
- SQPB does not deliver Super VHS resolution.
- S-VHS recording is not possible with this VCR.

*Clean the video heads using a dry cleaning cassette — TCL-2UX — when:*

- Rough, poor picture appears while a tape is played back.
- The picture is unclear or no picture appears.
- "USE CLEANING CASSETTE" appears on the screen (only with "SUPERIMPOSE" set to "ON": ☞ pg. 39.)

# Basic Playback Features





## A Changing display information

**Press DISPLAY during playback.**
Each time you press the button, the front panel display shows the time counter and the clock time alternately.

Time Counter ↔ Clock Time

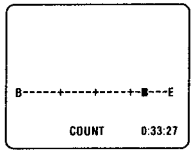
- To display the VCR status including the time counter and the clock time on the TV screen, see "Showing on-screen display" (☞ pg. 27).

**To reset the time counter,** press **C. RESET** on the Remote. The counter reading becomes "0:00:00". It is also reset when a tape is inserted.

## B Checking tape position

The tape position indicator appears on screen in the following cases:

- When you change the VCR operation mode from the stop mode to fast forward or rewind mode.
- When you perform an Index Search (☞ pg. 24) or Instant Review (☞ pg. 24).



The position of " ■ " in relation to "B" (Beginning) or "E" (End) shows you where you are on the tape.

*NOTES:*

- *"SUPERIMPOSE" must be set to "ON", or the indicator will not appear (☞ pg. 39).*
- *It may take a few seconds for the tape position indicator to be displayed.*

## C Playing back tape repeatedly

### — Repeat Play

You can play back a tape repeatedly (100 times).

**While playing back a tape, press and hold PLAY ( ► ) for more than 5 seconds.**
The play indicator ( ▷ ) on the front display panel starts flashing slowly, and a tape will be played back 100 times.
**To stop playback,** press **STOP ( ■ )** on the Remote or **STOP/EJECT ( ■ / ▲ )** on the front panel.

## D Adjusting tracking condition

### — Tracking Adjustments

**Automatic tracking adjustment**

This VCR automatically adjusts the tracking condition. Whenever you insert a tape and start playback, automatic tracking starts working and continuously analyzes the signal to enable optimum picture quality during playback.

**Manual tracking adjustment**

If automatic tracking cannot eliminate noises well during playback, use the manual tracking following the procedures below.

- You can also use the manual tracking during slow motion playback (☞ pg. 29).

**1 Activate manual tracking**
Press **CH ▲** and **▼** on the front panel at the same time during playback.

**2 Eliminate the noises on the TV screen.**
Press **CH ▲** and **▼** (or **CH** + and – on the Remote).
- Press it briefly for a fine adjustment, or press and hold for coarse adjustment. Watch the screen and continue adjustment until optimum picture and sound quality are achieved.

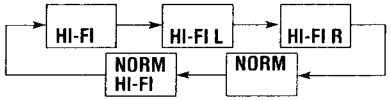
**3 Reactivate automatic tracking**
Press **CH ▲** and **▼** on the front panel at the same time. The automatic tracking becomes active again.

## E Selecting monitor sound

### — Audio Monitor

You can select the desired monitor sound.

**While playing back a tape on which stereo sound or SAP sound is recorded, press A. MONITOR on the Remote.**
Each time you press the button, sound changes as follows:



| | |
|---|---|
| HI-FI: | Normally select this.<br>Hi-Fi sound is played back. |
| HI-FI L: | Sound on the left Hi-Fi channel is played back. |
| HI-FI R: | Sound on the right Hi-Fi channel is played back. |
| NORM: | Sound on the normal track is played back. |
| NORM HI-FI: | Both sounds on the Hi-Fi track and normal track are mixed and played back. |

*Note:*

- *The above indication appears when "SUPERIMPOSE" is set to "ON" (☞ pg. 39), though the monitor sound changes in sequence.*
- *If the tape being played back has no Hi-Fi sound track, the normal sound track will be heard regardless of this setting.*
- *If RF connection (☞ pg. 6) is used for viewing pictures on the TV, sound will be monaural even though you select "HI-FI".*
- *You can also use the menu to select your desired monitor sound. (☞ pg. 41)*

## F Automatic operations after rewinding — Next Function Memory

The Next Function Memory "tells" the VCR what to do after rewinding is complete.

- Ensure that the VCR is in stop mode.

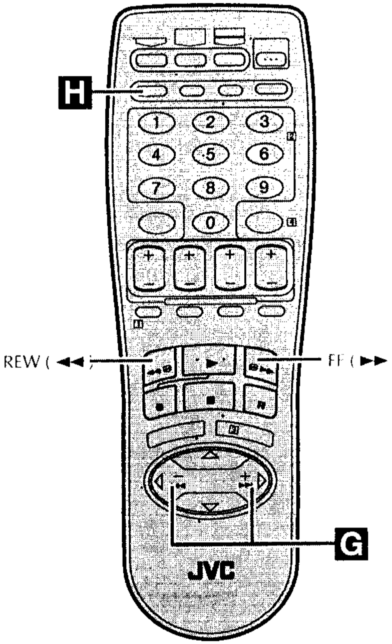
**a– For Automatic Playback Start**
Press **REW ( ◄◄ )**, then press **PLAY ( ► )** within 2 seconds.

**b– For Automatic Power Off**
Press **REW ( ◄◄ )**, then press **POWER** within 2 seconds.

**c– For Automatic Timer Standby**
Press **REW ( ◄◄ )**, then press **TIMER** within 2 seconds.

*NOTE:*

*It is not possible to select the Automatic Timer Standby function if the cassette's record safety tab is removed.*



**Other Useful functions for playback**

You can also use the following functions for recording.

- **Auto Picture** (☞ **pg. 39**)
When this function is set to "ON", this VCR checks the condition of the tape in use during playback, and compensates to provide the highest-possible playback pictures.

- **Picture Control** (☞ **pg. 39**)
This function helps you to adjust the playback picture quality according to your preference.

- **Video Stabilizer** (☞ **pg. 40**)
You can automatically correct vertical vibrations in the picture when playing back unstable recordings made on another VCR.

- **Blue Back** (☞ **pg. 40**)
When this function is set to "ON", the TV screen becomes all blue in the following cases:
  - When receiving a channel not in use.
  - When stopping playback.

## G Locating beginning of recordings — Index Search

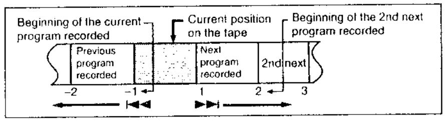
Index codes are placed on the tape at the beginning of each recording when recording on this VCR. You can find and automatically play back from the beginning of any recording using the Index Search function.

### 1 Start search

While the tape is not running, press **SHUTTLE PLUS** ◄◄ or ►►I on the Remote.

### 2 Access distant code

To access a recording of 2 to 9 index codes away, press **SHUTTLE PLUS** I◄◄ or ►►I repeatedly until the correct number is displayed on screen (only if "SUPERIMPOSE" is set to "ON" ; ☞ pg. 39). Playback begins automatically when the desired recording is located.


Beginning of the current program recorded
Current position on the tape
Beginning of the 2nd next program recorded
Previous program recorded
Next program recorded
2nd next
–2
–1
1
2
3
I◄◄
►►I

- If you want to find the very beginning of the desired program, press **REW ( ◄◄ )** or **FF ( ►► )** after playback starts.

*NOTE:*

*An index code is not placed on the tape when recording is resumed from recording pause.*

## H Locating beginning of timer recordings — Instant Review

At the press of a button, you can turn on the VCR, rewind the tape and begin to view the most recent timer-recorded program.

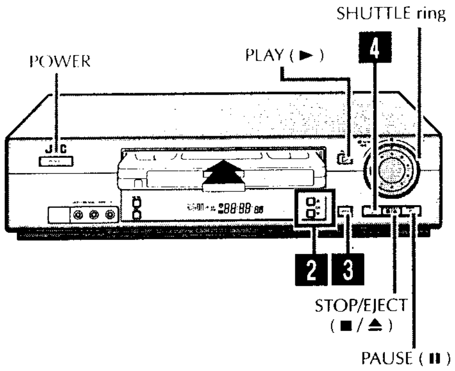
**Press REVIEW on the Remote after ensuring that the VCR is in the timer recording standby mode.**

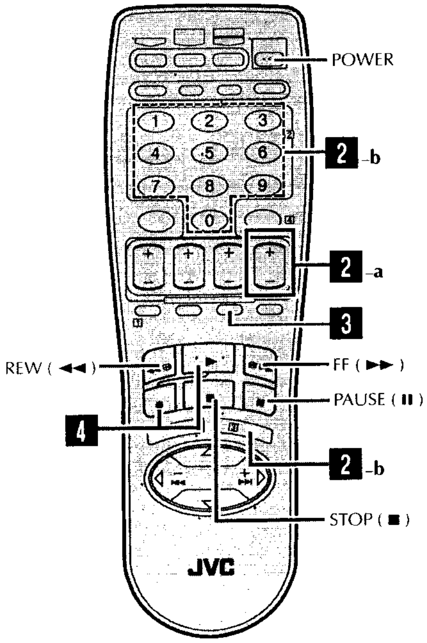
- The VCR turns on, and rewinds to the index code indicating the beginning of the last timer-recorded program, then begins playback automatically.
- You can access a program of 2 to 9 index codes away from the current position on the tape. If, for example, you have 5 programs recorded and you want to watch the third one, press **REVIEW** three times.
- If you want to find the very beginning of the desired program, press **REW ( ◄◄ )** or **FF ( ►► )** after playback starts.
- If the tape is already rewound when **REVIEW** is pressed, it will play the tape from the beginning. It will not fast-forward to an index code.
- The Instant Review function will also operate if the VCR is turned on.

---

# Basic Recording

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





### 1 Load a cassette

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape before inserting the cassette.

### 2 Select recording channel

**On the front panel:**
Press **CH▲▼**.

**On the Remote:**
a– Press **CH** + or –.
or
b– Press the **Number** keys then **ENTER**.
(The channel changes after a few seconds whether you press **ENTER** or not.)

- If you connect the TV and the VCR only using the RF connection, press **TV/VCR** on the Remote so that the VCR mode indicator lights on the front display panel, to view the program to be recorded.

### 3 Set tape speed

Press **SP/EP** to set the recording speed.

### 4 Start recording

**On the front panel:**
Press **REC ( ● )**.

**On the Remote:**
While holding **REC ( ● )**, press **PLAY ( ► )**.

**To pause recording**

Press **PAUSE ( II )**. To resume recording, press **PLAY ( ► )**.

**To stop recording**

Press **STOP ( ■ )** on the Remote or **STOP/EJECT ( ■ / ▲ )** on the front panel.

**To rewind the tape**

Press **REW ( ◄◄ )** (or turn the **SHUTTLE** ring on the front panel to the left).

**To fast-forward the tape**

Press **FF ( ►► )** (or turn the **SHUTTLE** ring on the front panel to the right).

**To eject the tape**

Press **STOP/EJECT ( ■ / ▲ )** on the front panel when the tape is not running.

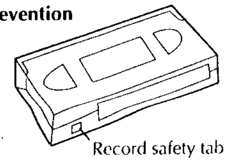
- You can also eject the cassette with the VCR turned off.

**To turn off the VCR**

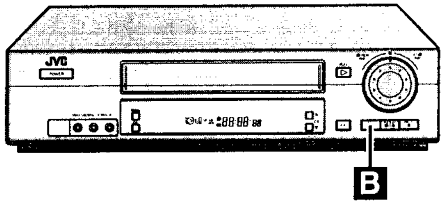
Press **POWER**.

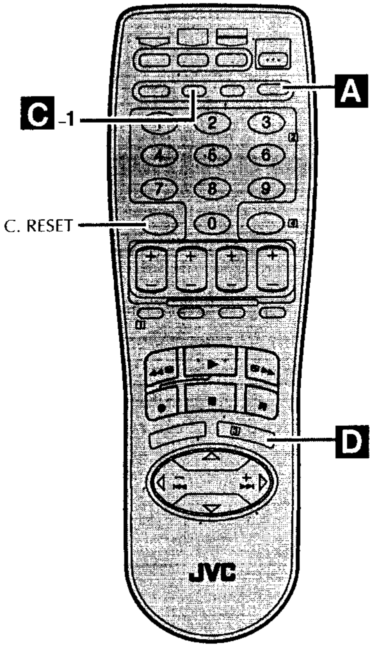
**Accidental erasure prevention**

To prevent accidental recording on a recorded cassette, remove its record safety tab.
To record on it later, cover the hole with adhesive tape.



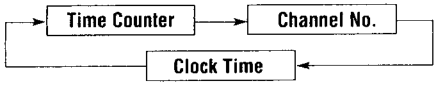
# Basic Recording Features





## A Changing display information

**Press DISPLAY during recording or recording pause.**
Each time you press the button, the front panel display shows the time counter, channel number and the clock time in sequence.



- To display the VCR status including the time counter, channel number, and the clock time on the TV screen, see "Showing on-screen display" (☞ pg. 27).

**To reset the time counter,** press **C. RESET** on the Remote. The counter reading becomes "0:00:00". It is also reset when a tape is inserted.

## B Specifying recording length

### — Instant Timer Recording (ITR)

You can easily specify the recording length from 30 minutes to 6 hours and shut off the VCR after recording is finished.

**During recording, press REC ( ● ) on the front panel repeatedly until the recording length you want appears on the front display panel.**
The ○ (record) indicator starts flashing.
Each time you press the button, recording length increases in 30-minute intervals (up to 6 hours).

**To cancel an ITR,** press **STOP ( ■ )** on the Remote or **STOP/EJECT ( ■ / ▲ )** on the front panel.

## C Watching one program while recording another

### 1 Engage TV mode

During recording...

- **If you connect the TV and the VCR only using the RF connection (☞ pg. 6) to view pictures from the VCR**
  Press **TV/VCR** on the Remote so that VCR mode indicator goes off from the front display panel. The TV broadcast being recorded disappears.)
- **If you are using the AV connection (☞ pg. 6) to view pictures from the VCR**, change the TV's input mode from AV to TV.

### 2 Select channel for viewing

Select the channel, you want to watch, on the TV.

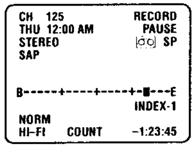
## D Showing on-screen display

When "SUPERIMPOSE" is set to "ON" (☞ pg. 39), you can see the current VCR status on the TV screen.

- For more detailed information about the on-screen display, see page 55.

### 1 Display VCR status on TV screen

During recording or recording pause, press **OSD**.
All indications corresponding to the current VCR status are displayed for 5 seconds.
The time counter remains on the screen indicating the elapsed time.



- The indications are not recorded.

### 2 Erase on-screen display

Press **OSD** again.

*NOTE:*

- *If the VCR is in recording pause mode, "RECORD/PAUSE" is always displayed.*
- *The VCR status can be also displayed during playback.*

**Other useful functions for recording**

You can also use the following functions for recording.

- **Recording Resume Function**
  If there is a power outage during recording (or Instant Timer Recording, or timer recording), the recording will resume automatically when the power is restored to the VCR. (No setting is required for this function.)

- **Second Audio Recording (☞ pg. 41)**
  This VCR's built-in MTS decoder enables reception of Multichannel TV Sound broadcast.

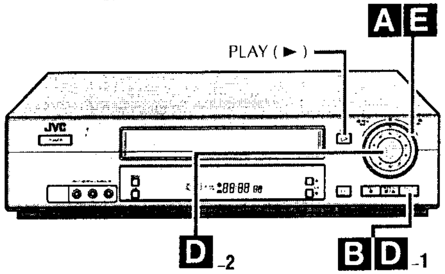
To record a SAP program received, set "2ND AUDIO RECORD" to "ON" using the menu screen.

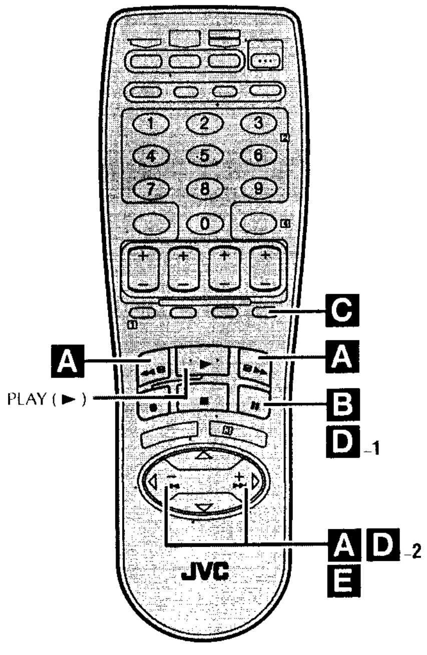
*Note:*

*When the channel is changed on the VCR;*

- *The "STEREO" indication appears on the screen for about 5 seconds if the program is a stereo broadcast.*
- *The "SAP" indication appears on the screen for about 5 seconds if the program is a SAP broadcast.*
- *Both indications appear when a stereo program is accompanied by SAP sound.*

# Special Effect Playback





## A Locating particular scene rapidly — Picture Search

■ **High-Speed Picture Search:**

Possible during normal playback or still picture playback.
You can rapidly locate a particular scene on the tape.

On the front panel:

**To do forward picture search,** turn the **SHUTTLE** ring fully to the right. When you release the ring, a still picture appears.
**To do reverse picture search,** turn the **SHUTTLE** ring fully to the left. When you release the ring, a still picture appears.

- If you turn the ring fully and release it within 1 second, picture search continues.

On the Remote:

**To do forward picture search,** press **FF** (►►).
**To do reverse picture search,** press **REW** (◄◄).

- If you press and hold the button for more than 2 seconds, simply releasing it cancels the picture search, and normal playback resumes.

**To resume normal playback,** press **PLAY** ( ► ).

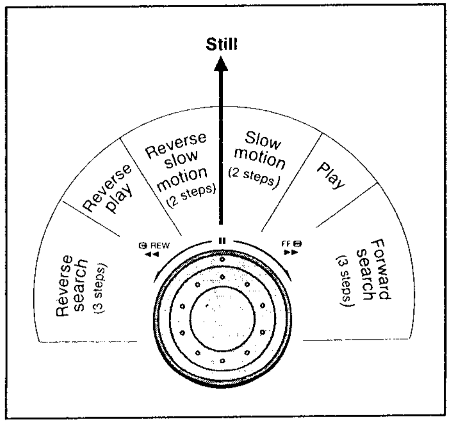
■ **Variable-Speed Picture Search:**

You can change the speed of picture search.

How to use the SHUTTLE ring on the front panel:

Turn the **SHUTTLE** ring to the right (forward search) or to the left (reverse search).
As you turn the **SHUTTLE** ring, picture search speed changes (see the diagram below).
When you release the ring, a still picture appears.

- The speed of picture search is determined by the rotating angle of the **SHUTTLE** ring.



How to use the SHUTTLE PLUS buttons on the Remote:

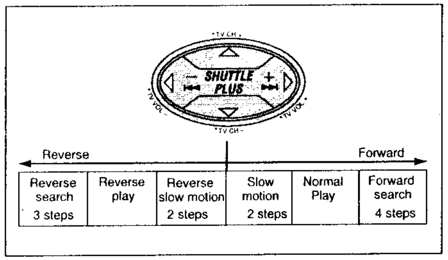
**To do forward picture search,** press **SHUTTLE PLUS** ►►| repeatedly.
Each time you press the button, the search speed increases.

- To decrease the speed while forward picture search (toward normal playback, then reverse picture search), press **SHUTTLE PLUS** |◄◄ repeatedly.

**To do reverse picture search,** press **SHUTTLE PLUS** |◄◄ repeatedly.
Each time you press the button, the search speed increase while reverse picture search.

- To decrease the speed while reverse picture search (toward normal playback, then forward picture search), press **SHUTTLE PLUS** ►►| repeatedly.

**To resume normal playback,** press **PLAY** ( ► ).



| Reverse search<br>3 steps | Reverse play | Reverse slow motion<br>2 steps | Slow motion<br>2 steps | Normal Play | Forward search<br>4 steps |
|---|---|---|---|---|---|

## B Viewing still picture

### — Still Picture Playback

**Press PAUSE ( II ) during normal playback.**
Playback is freezed and a still picture appears.

**To resume normal playback,** press **PLAY** ( ► ).

*NOTE:*

*To obtain a noiseless still picture, it may be necessary to adjust tracking in slow motion playback before starting still picture playback.*

## C Skipping unwanted portions

### —Skip Search

You can skip over (view at high speed) unwanted portions of the tape.

**Press SKIP SEARCH once to 4 times during playback.**
Each press initiates a 30-second period of high speed playback (up to 2 minutes). When the specified portion of the tape is skipped, normal playback resumes automatically.
**To return to normal playback during Skip Search,** press **PLAY** ( ► ).

## D Viewing still picture frame by frame — Frame-by-Frame Playback

### 1 Pause during playback

Press **PAUSE** ( **II** ).
Playback is freezed and a still picture appears.

### 2 Advance or reverse still picture

On the front panel:

**To advance a still picture,** turn the **JOG** dial to the right.
**To reverse a still picture,** turn the **JOG** dial to the left.

On the Remote:

**To advance a still picture,** press **SHUTTLE PLUS** ►►| (or **PAUSE** ( **II** )) repeatedly.
**To reverse a still picture,** press **SHUTTLE PLUS** |◄◄ repeatedly.

**To resume normal playback,** press **PLAY** ( ► ).

## E Viewing slow motion picture

### — Slow Motion Playback

On the front panel:

**During normal playback or still picture playback:**
Turn the **SHUTTLE** ring slowly to the right (forward slow motion) or to the left (reverse slow motion) so that slow motion playback starts. When you release the ring, a still picture appears.

- Holding **PAUSE** ( **II** ) for more than 2 seconds also starts forward slow motion playback.

On the Remote:

- **During normal playback:**

Press **SHUTTLE PLUS** |◄◄ to decrease the playback speed.
Each time you press the button, the speed decreases (toward reverse slow motion playback, then reverse picture search).

- Holding **PAUSE** ( **II** ) for more than 2 seconds also starts forward slow motion playback.

**To resume normal playback,** press **PLAY** ( ► ).

- **During still picture playback:**

Press and hold **SHUTTLE PLUS** ►►| to start forward (or **SHUTTLE PLUS** |◄◄ to start reverse) slow motion playback. When you release the button, slow motion playback stops and a still picture appears.

- Holding **PAUSE** ( **II** ) for more than 2 seconds also starts forward slow motion playback.

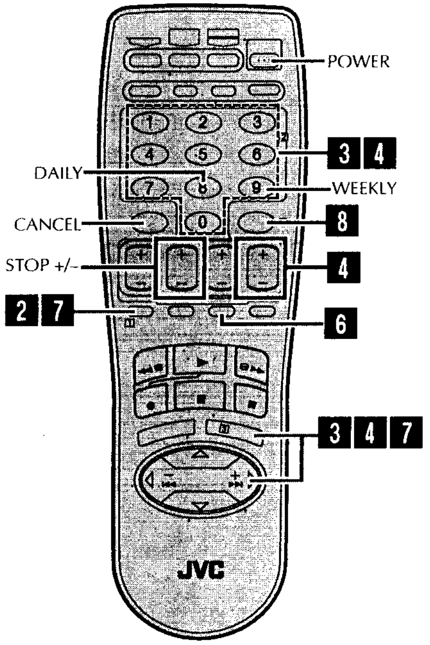
**To resume normal playback,** press **PLAY** ( ► ).

*NOTE:*

*Manual tracking is possible during slow motion playback.*
*During slow motion playback, simply press* **CH ▲** *and* **▼** *on the front panel or* **CH +** *or – on the Remote to adjust tracking.*

# VCR Plus+ Timer Programing

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.



Timer recording allows you to program the VCR to automatically record a broadcast at some future time. Up to 8 timer recording programs can be made using VCR Plus+ timer programing or Express timer programing method (☞ pg. 34) as far as a year in advance.

The VCR Plus+ timer programing system eliminates the need to input channel, date, start and stop time data when programing timer recording settings. Simply key in the PlusCode number for the TV broadcast you wish to record and the VCR's timer will be automatically programed. (The PlusCode programing numbers are the numbers next to the program in most TV listing.)

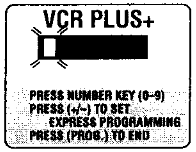
### 1 Load a cassette

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape, then load it into the VCR.

- The VCR turns on, and the counter is reset, automatically.

### 2 Access VCR Plus+ screen

Press **PROG.** on the Remote.

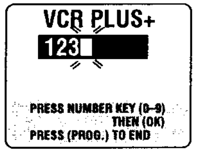


```
VCR PLUS+

PRESS NUMBER KEY (0–9)
PRESS (+/–) TO SET
    EXPRESS PROGRAMMING
PRESS (PROG.) TO END
```

- The clock must be set to access the VCR Plus+ screen. If you have not set the clock, the Main Menu screen appears after an error message is displayed. Refer to page 8 for the Plug & Play setting or page 10 for the clock setting procedure.

### 3 Enter PlusCode number

Press the appropriate **Number** keys to input the PlusCode number printed in the TV listings for the TV broadcast you wish to record, then press **OK**.



```
VCR PLUS+
123

PRESS NUMBER KEY (0–9)
              THEN (OK)
PRESS (PROG.) TO END
```

Then;

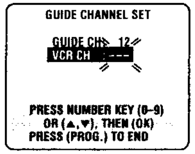
If the Guide Channel Set screen appears — go to step **4**.

If the VCR Plus+ Program screen appears — go to step **5**.

- To make corrections, press **CANCEL** and input the correct PlusCode number.

### 4 Input receiving channel number

The guide channel number, which is assigned to the TV or cable station for the PlusCode number that you entered in step **3**, will appear automatically on the Guide Channel Set screen.



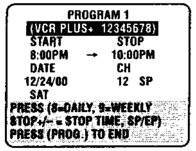
```
GUIDE CHANNEL SET

GUIDE CH    12
VCR CH    : ---

PRESS NUMBER KEY (0–9)
  OR (▲,▼), THEN (OK)
PRESS (PROG.) TO END
```

Press the **Number** keys (or **CH** +/– or **SHUTTLE PLUS** △▽) to input the number of the channel on which the broadcast for the PlusCode number is received on the VCR or cable box, then press **OK**.

- The Guide Channel Set screen appears only when you input the PlusCode number of a station for which the guide channel number has not been set previously.
- If you receive your channels with a cable box and if you have properly set your Controller, "CABLE CH" appears in place of "VCR CH". If not, refer to pages 15 – 17.

### 5 Check program date

The PlusCode number you entered and the corresponding timer recording program is displayed on the Program screen. Check to make sure it is accurate.



```
PROGRAM 1
(VCR PLUS+  12345678)
START         STOP
8:00PM   →   10:00PM
DATE          CH
12/24/00      12  SP
SAT
PRESS (8=DAILY, 9=WEEKLY
STOP+/– = STOP TIME, SP/EP)
PRESS (PROG.) TO END
```

- To change the stop time, press **STOP +/–**.
- To timer-record daily (Monday–Friday) or weekly serials, press **DAILY (M-F)** (number "8") or **WEEKLY** (number "9"). "DAILY" or "WEEKLY" appears on the Program screen. Pressing the button again makes each corresponding display disappear.
- If you made a mistake, press **CANCEL** to access the VCR Plus+ screen again and input the correct PlusCode number.
- If an incorrect PlusCode number or the one for a broadcast already finished has been inputted, "ERROR" is displayed for about 5 seconds, then the VCR Plus+ screen reappears.

### 6 Set tape speed

Press **SP/EP**.

### 7 Return to normal screen

Press **PROG.** or **OK**.

"PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- If "PROGRAM NOT COMPLETED PROGRAM OVERLAP" appears, you have another program overlapping the program you have just made. The Program Check screen appears and conflicting programs will start blinking. You can now correct the conflicting programs. See "When programs overlap each other" on page 37.

### 8 Engage timer recording standby mode

Press **TIMER**.

The VCR turns off automatically and "⏲" is displayed on the front display panel.

### To use the VCR while it is in timer recording standby mode

Press **TIMER** to cancel the timer recording standby mode, then press **POWER** to turn on the VCR.

DO NOT forget to put the VCR into timer recording standby mode again by pressing **TIMER** after you use the VCR; otherwise, you cannot record the broadcasts you want.

- When "AUTO TIMER" (☞ pg. 39) is set to "ON", the timer recording standby mode is automatically engaged when the VCR is turned off. It is temporarily canceled when the VCR is turned on. You do not have to press **TIMER** to engage or disengage the timer recording standby mode.

**IMPORTANT**

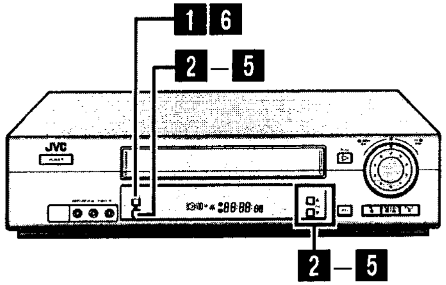
If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR CH or CABLE CH number will be displayed on the Program screen in step **5**. When this happens, set the correct guide channel number for that station. (☞ pg. 32, "VCR Plus+ Setup")

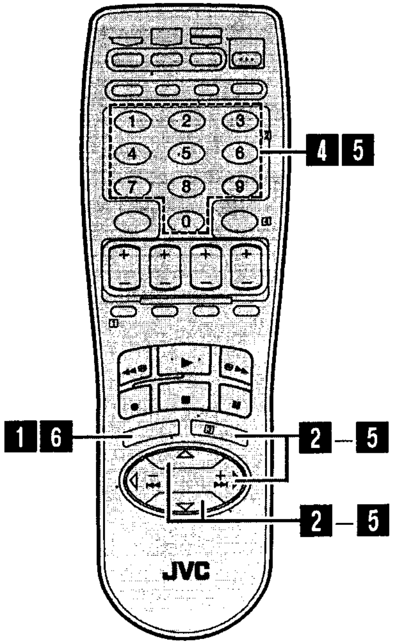
*NOTES:*

- *Even if a power failure occurs, the VCR keeps your timer programs. However, the clock time, channel settings, and other menu settings are lost if it lasts for more than 3 minutes. As a result, when the power is supplied again to this VCR after the power failure, the following will take place.*
  1. *This VCR starts the Plug & Play setting automatically to restore the clock time and channel setting.*
  2. *If the clock time and channel setting are restored correctly, each timer program you have made will start unless its end time already passes.*
- *To timer-record cable channels received through a cable box, be sure to keep the cable box turned on.*

# VCR Plus+ Setup

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





**IMPORTANT**

If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR CH or CABLE CH number will be displayed on the Program screen (☞ step **5** on page 31). When this happens, perform the following steps to set the correct guide channel number for that station.

To ensure that VCR Plus+ timer recording operates correctly, it is necessary to set the VCR Plus+ "Guide Channel Set" for each station. Read the following information carefully.

**VCR Plus+ guide channel matching**

The VCR Plus+ programing system assigns a VCR Plus+ guide channel to the TV channels and the cable channels. These guide channel numbers are also called the VCR Plus+ channel codes. Most TV listings have a section, usually a chart, indicating the guide channel numbers assigned to each station. For accurate VCR Plus+ programing, the VCR Plus+ guide channel number for each station should match the channel number on which it is received in your area.

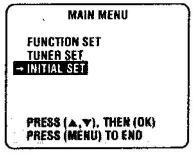
*NOTES:*

- *In many instances, the VCR Plus+ guide channel numbers for cable and broadcast TV stations DO NOT match the channel number on which it is received by your VCR or cable box. Check your TV listing, or contact your cable supplier for details.*
- *Many TV stations can be viewed on cable. Check your TV listing, or contact your cable supplier for details.*

## 1 Access Main Menu screen

Press **MENU**.

## 2 Access Initial Set screen


MAIN MENU

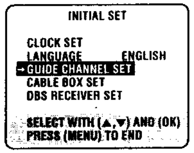
FUNCTION SET
TUNER SET
→ INITIAL SET

PRESS (▲,▼). THEN (OK)
PRESS (MENU) TO END

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "INITIAL SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

## 3 Access Guide Channel Set screen


INITIAL SET

CLOCK SET
LANGUAGE ENGLISH
→ GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

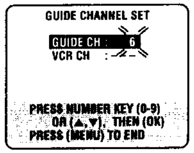
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "GUIDE CHANNEL SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "GUIDE CHANNEL SET", then press **OK** or **SHUTTLE PLUS** ▷.

## 4 Input guide channel number

(Ex.) When inputting the guide channel number 6 for WNJU(Ind.)


GUIDE CHANNEL SET

GUIDE CH : 6
VCR CH : -- --

PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

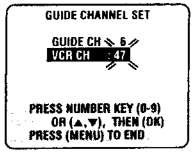
**On the front panel:**
Press **CH▲▼** to select the VCR Plus+ guide channel number as shown in the TV listing, then press **OK**.

**On the Remote:**
Press the **Number** keys or **SHUTTLE PLUS** △▽ to input the VCR Plus+ guide channel number as shown in the TV listing, then press **OK** or **SHUTTLE PLUS** ▷.

- If you receive your channels with a cable box and if you have properly set your Controller, "CABLE CH" appears in place of "VCR CH". If not, refer to pages 15 – 17 and re-perform the procedure.

## 5 Input receiving channel number

(Ex.) If WNJU(Ind.) is received on channel 47


GUIDE CHANNEL SET

GUIDE CH : 6
VCR CH : 47

PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

**On the front panel:**
Press **CH▲▼** to select the number of the channel on which the guide channel's broadcasts are received, then press **OK**.

**On the Remote:**
Press the **Number** keys or **SHUTTLE PLUS** △▽ to input the number of the channel on which the guide channel's broadcasts are received, then press **OK** or **SHUTTLE PLUS** ▷.

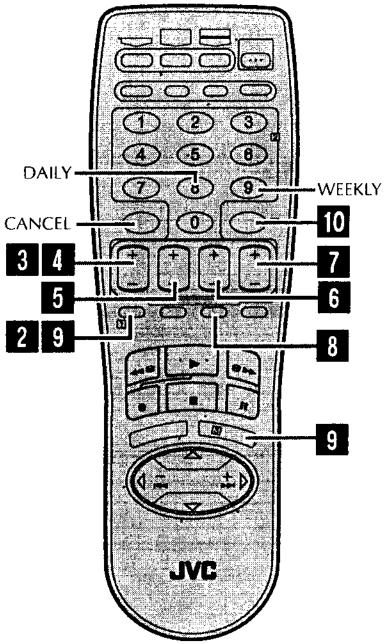
- Repeat steps **4** and **5** for each instance.

## 6 Return to normal screen

Press **MENU**.

# Express Timer Programing

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.



You can directly program the VCR's timer to record up to 8 broadcasts, as far as a year in advance. Remember, the clock must be set before you can program the timer (☞ pg. 8 or 10).

### 1 Load a cassette

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape, then load it into the VCR.

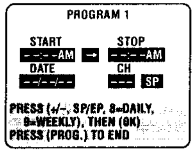
- The VCR turns on, and the counter is reset, automatically.

### 2 Access VCR PLUS+ screen

Press **PROG.**.

### 3 Access Program screen

Press **START +/–** once. (If no program is stored, "PROGRAM 1" appears.)

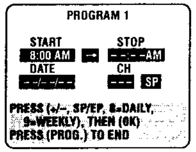


PROGRAM 1
START --:--AM → STOP --:--AM
DATE --/--/-- CH --- SP
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY), THEN (OK)
PRESS (PROG.) TO END

### 4 Set program start time

Press **START +/–** repeatedly to enter the time you want recording to start.

- Press and hold **START +/–** to increase the time in 30-minute intervals.



PROGRAM 1
START 8:00 AM → STOP --:--AM
DATE --/--/-- CH --- SP
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY), THEN (OK)
PRESS (PROG.) TO END

### 5 Set program stop time

Press **STOP +/–** repeatedly to enter the time you want recording to stop.

- Press and hold **STOP +/–** to increase the time in 30-minute intervals.

### 6 Set program date

Press **DATE +/–**. (The current date is displayed on the screen. The date you enter appears in its place.)

### 7 Set channel number

Press **CH +/–**.

- If you are using a DBS receiver, see "ATTENTION FOR DBS RECEIVER USERS" on next page.
- Holding down **CH +/–** rapidly changes the channel numbers.

### 8 Set tape speed

Press **SP/EP** to set the tape speed.

### 9 Return to normal screen

Press **PROG.** or **OK**.

"PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- If "PROGRAM NOT COMPLETED PROGRAM OVERLAP" appears, you have another program overlapping the program you have just made. The Program Check screen appears and conflicting programs will start blinking. You can now correct the conflicting programs. See "When programs overlap each other" on page 37.

### 10 Engage timer recording standby mode

Press **TIMER**.

The VCR turns off automatically and "⏲" is displayed on the front panel display.

### To timer-record daily (Monday–Friday) or weekly serials

Press **DAILY (M-F)** (number "**8**") or **WEEKLY** (number "**9**") anytime during steps 3 through 9.

"DAILY" or "WEEKLY" appears on the Program screen.

- Pressing the button again makes the corresponding indication disappear.

### To use the VCR while it is in timer recording standby mode

Press **TIMER** to cancel the timer recording standby mode, then press **POWER** to turn on the VCR.

DO NOT forget to put the VCR into timer recording standby mode again by pressing **TIMER** after you use the VCR; otherwise, you cannot record the broadcast you want.

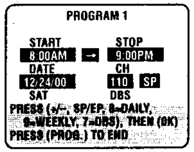
- When "AUTO TIMER" (☞ pg. 39) is set to "ON", the timer recording standby mode is automatically engaged when the VCR is turned off. It is temporarily canceled when the VCR is turned on. You do not have to press **TIMER** to engage or disengage the timer recording standby mode.

## *NOTES:*

- *Even if a power failure occurs, the VCR keeps your timer programs. However, the clock time, channel settings, and other menu settings are lost if it lasts for more than 3 minutes. As a result, when the power is supplied again to this VCR after the power failure, the following will take place.*
  1. *This VCR starts the Plug & Play setting automatically to restore the clock time and channel setting.*
  2. *If the clock time and channel setting are restored correctly, each timer program you have made will start unless its end time already passes.*
- *Programs that start after midnight must have the next day's date.*
- *After timer recording is completed, the VCR turns off automatically.*
- *You can program the timer recording while a regular recording is in progress; the menu screens will not be recorded.*
- *If the tape reaches its end during timer recording, the cassette is automatically ejected.*
- *To timer-record cable or satellite channels, be sure to keep the cable box or DBS receiver turned on.*

### ATTENTION FOR DBS RECEIVER USERS

If you are using a DBS receiver (unless "DBS RECEIVER SET" is set to "OFF" ☞ pg. 19), the band indication (TV, CATV or DBS) appears under the channel number indication.



PROGRAM 1
START 8:00AM → STOP 9:00PM
DATE 12/24/00 CH 110 SP
SAT DBS
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY, 7=DBS), THEN (OK)
PRESS (PROG.) TO END

TV :To timer-record a regular TV broadcast received on the VCR.
CATV :To timer-record a cable TV broadcast received on the VCR, or through a cable box (unless "CABLE BOX SET" is set to "OFF" ☞ pg. 16).
DBS :To timer-record a satellite broadcast received through a DBS receiver.

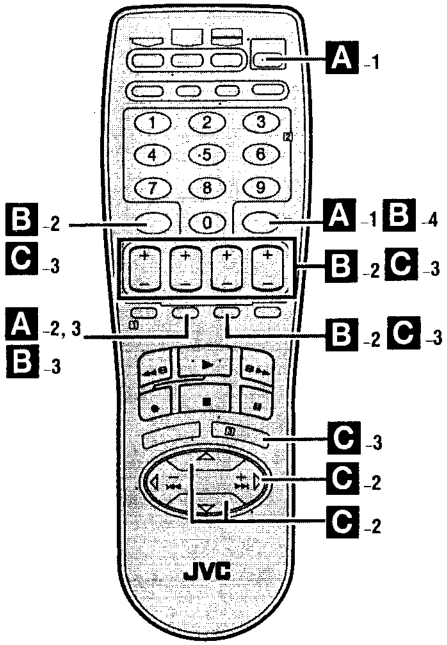
## *NOTE:*

*If "BAND" is set to "TV" on the Tuner Set screen (☞ pg. 13) and "CABLE BOX SET" is set to "OFF" on the Cable Box Set screen (☞ pg. 16), "CATV" will not be displayed on the Program screen; If "BAND" is set to "CATV" or "CABLE BOX SET" is set to "ON", "TV" will not be displayed.*

If the channel number entered requires that the band be set, "7=DBS" is displayed on the screen.

If this happens, press the **Number** key "**7 (DBS)**" to select "DBS".

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.



**Other Useful functions for timer recording**

You can also use the following functions for timer recording.

- **Auto Timer (☞ pg. 39)**
When "AUTO TIMER" is set to "ON", the timer recording standby mode is automatically engaged when the VCR is turned off. It is temporarily canceled when the VCR is turned on. You do not have to press **TIMER** to engage or disengage the timer recording standby mode.

- **Auto SP → EP Timer (☞ pg. 40)**
If there is not enough tape to record the entire broadcast for recording in SP mode, the VCR automatically switches to EP mode to allow complete recording. This feature is especially handy when recording a broadcast of more than 2 hours in length.

## A Checking program settings

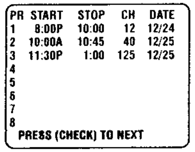
### 1 Disengage timer

Press **TIMER**, then press **POWER**.

- When "AUTO TIMER" (☞ pg. 39) is set to "ON", you do not have to press **TIMER**.

### 2 Access Program Check screen

Press **PROG. CHECK**.



```
PR START   STOP   CH  DATE
1   8:00P  10:00   12 12/24
2  10:00A  10:45   40 12/25
3  11:30P   1:00  125 12/25
4
5
6
7
8
 PRESS (CHECK) TO NEXT
```

### 3 Access Program screen

Press **PROG. CHECK** again to check more detailed information. Each time you press **PROG. CHECK**, the next program's Program screen appears. When all Program screens are shown, normal screen resumes.

## B Canceling or changing program settings

### 1 Access Program screen

Repeat steps **1** to **3** above.

### 2 Cancel or change program setting

**To cancel a program,** press **CANCEL** when the Program screen you do not want is shown.

**To change a program,** press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **CH+/–**, and/or **SP/EP** when the Program screen on which you want to make changes is shown.

### 3 Return to normal screen

Press **PROG. CHECK** as many times as necessary until no Program screen is shown.

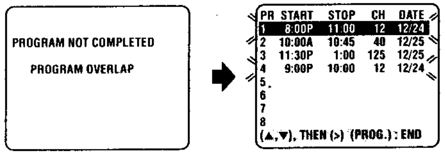
### 4 Reengage timer recording standby mode

Press **TIMER**.

- When "AUTO TIMER" (☞ pg. 39) is set to "ON", the timer recording standby mode automatically resumes when you turn off the VCR.

## C When programs overlap each other

If "PROGRAM NOT COMPLETED PROGRAM OVERLAP" appears, you have another program overlapping the program you have just made.
The Program Check screen appears and conflicting programs will start blinking.



```
PROGRAM NOT COMPLETED

  PROGRAM OVERLAP
```

```
PR START   STOP   CH  DATE
1   8:00P  11:00   12 12/24
2  10:00A  10:45   40 12/25
3  11:30P   1:00  125 12/25
4   9:00P  10:00   12 12/24
5
6
7
8
(▲,▼), THEN (>)  (PROG.) : END
```

**EX. Program 1 (you have just made) and Program 4 overlap each other**

### 1 Confirm overlapping programs

Overlapping programs blink on the screen.

### 2 Select program to modify

Press **SHUTTLE PLUS** △▽, then press **SHUTTLE PLUS** ▷.

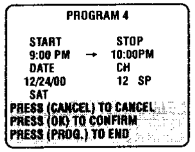
- You can only select one of the overlapping programs.

NOTE:

*If you do not mind this overlap, press* **PROG.** *to finish the timer program setting. See "ATTENTION" to the right. Without doing anything for about 1 minutes, the VCR will finish the timer programing.*

### 3 Cancel or change program setting

**To cancel a program,** press **CANCEL** when the Program screen you do not want is shown. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.



```
       PROGRAM 4

  START        STOP
  9:00 PM  →  10:00PM
  DATE         CH
 12/24/00      12  SP
  SAT
PRESS (CANCEL) TO CANCEL
PRESS (OK) TO CONFIRM
PRESS (PROG.) TO END
```

**To change a program,** press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **CH+/–**, and/or **SP/EP** when the Program screen on which you want to make changes is shown, then press **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

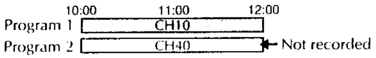
NOTE:

*If the overlap is not yet solved or another overlap occurs with the timer program setting made last after making correction on a program, the conflicting programs will be shown on the Program Check screen again. Repeat the above steps again until the overlap is solved.*

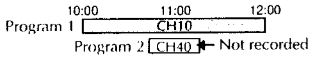
**ATTENTION**

If there is a conflict in the timer schedule and one program overlaps with another, only the parts shown below in gray will be recorded.

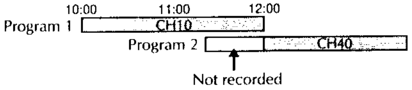
***Pattern 1:*** *The program with the lower program number will be recorded.*



***Pattern 2:*** *The program starting earlier will be recorded.*

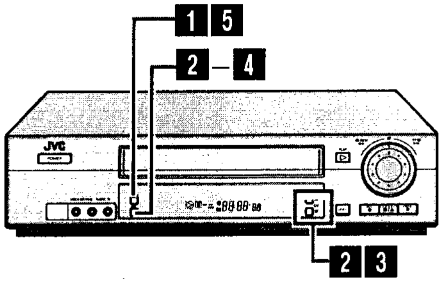


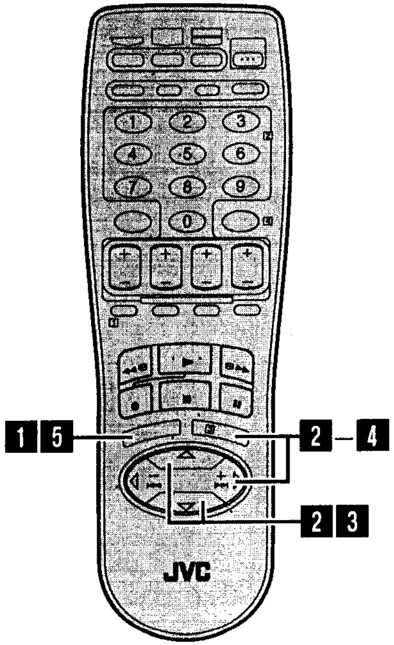
***Pattern 3:*** *The program starting earlier will be recorded, followed by the remaining portion of the other program.*



# Useful Function Settings

Turn on the VCR and the TV, and select the VCR channel 3 or 4 (or AV mode) on the TV.





You can use the other useful function settings on the Function Set screen by following the procedure described below.

- For the functions you can set on the Function Set screen, see pages 39 to 41.

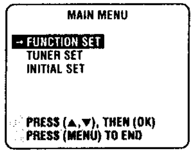
## 1 Access Main Menu screen

Press **MENU**.

## 2 Access Function Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "FUNCTION SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS** ▷.



MAIN MENU

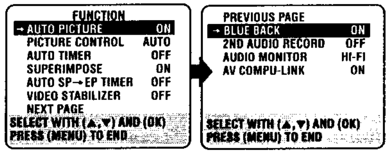
→ FUNCTION SET
TUNER SET
INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

## 3 Select Function.

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to the function you want to set, then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to the function you want to set, then press **OK** or **SHUTTLE PLUS** ▷.



FUNCTION
→ AUTO PICTURE ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

PREVIOUS PAGE
→ BLUE BACK ON
2ND AUDIO RECORD OFF
AUDIO MONITOR HI-FI
AV COMPU-LINK ON
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

## 4 Change setting

**On the front panel:**
Press **OK**.

**On the Remote:**
Press **OK** or **SHUTTLE PLUS** ▷.

## 5 Return to normal screen

Press **MENU**.

* The default setting is **bold** in the table below.

| | |
|---|---|
| **■ AUTO PICTURE**<br>**ON**<br>OFF | When this function is set to "ON", this VCR checks the condition of the tape in use during playback, and compensates to provide the highest-possible playback pictures. |
| **■ PICTURE CONTROL**<br>**AUTO** (NORM): Normally select this. Picture quality is adjusted automatically. When "AUTO PICTURE" is "OFF", "NORM" will appear instead of "AUTO".<br>EDIT: Minimizes picture degradation during editing (recording and playback).<br>SOFT: Reduces image coarseness when viewing overplayed tapes containing much noise.<br>SHARP: Clearer, sharper-edged picture when viewing images with much flat, same-colored surfaces such as cartoons. | This function helps you to adjust the playback picture quality according to your preference.<br>*NOTES:*<br>● *When you select "EDIT", "SOFT" or "SHARP", the selected mode will not change until you select again.*<br>● *Select "EDIT" when you are dubbing tapes (☞ pg. 42 to 44). After you finish dubbing the tapes, select "AUTO" ("NORM" when "AUTO PICTURE" is "OFF".)* |
| **■ AUTO TIMER**<br>ON<br>**OFF** | ● **When this function is set to "ON":**<br>The timer recording standby mode is automatically engaged when the VCR is turned off. It is temporarily canceled when the VCR is turned on. You do not have to press **TIMER** to engage or disengage the timer recording standby mode.<br>● **When this function is set to "OFF":**<br>For safety, all buttons except **TIMER** are disabled while the VCR is in the timer recording standby mode. To use the VCR as usual, press **TIMER**. |
| **■ SUPERIMPOSE**<br>**ON**<br>OFF | When this function is set to "ON", various VCR status information (on-screen display) appears on the screen.<br>*NOTES:*<br>● *When you use this VCR as the playback VCR for editing a tape, be sure to set this function to "OFF"; otherwise, the VCR status information (on-screen display) will be recorded on the edited tape.*<br>● *If you select a channel on which no signal is received, the channel number is displayed regardless of this function setting.* |

* The default setting is **bold** in the table below.

### ■ AUTO SP → EP TIMER

ON
**OFF**

When this function is set to "ON", the VCR automatically switches to EP mode to allow complete recording if there is not enough tape to record the entire program while timer-recording in SP mode.

**For Example . . .**

Recording a program of 210 minutes in length onto a 180-minute tape

| Approximately 110 minutes | Approximately 30 minutes |
|---|---|
| SP mode | EP mode |

Make sure you set this function to "ON" before the timer-recording starts.

*NOTES:*

- *If you have programed the VCR to timer-record 2 or more programs, the second program and those thereafter may not fit on the tape with this function set to "ON". In this case, do not use this function, but change the tape speed manually during timer programing.*
- *In order to ensure that the recording fits on the tape, this function may leave a slight non-recorded portion at the end of the tape.*
- *There may be some noise and sound disturbance where the tape speed switches from SP to EP mode on the tape.*
- *This function is not available during ITR (Instant Timer Recording), and will not work properly on the following tapes: T(ST)-30, T(ST)-60, T(ST)-90, and T(ST)-120.*

### ■ VIDEO STABILIZER

ON
**OFF**

When this function is set to "ON", you can automatically correct vertical vibrations in the picture when playing back unstable recordings made on another VCR.

*NOTES:*

- *When you finish viewing a tape, be sure to set this function to "OFF".*
- *Regardless of the setting, this function has no effect during recording and during special effects playback.*
- *The on-screen display may jitter vertically when this function is set to "ON".*
- *To watch recordings with close-caption, set this function to "OFF".*

### ■ BLUE BACK

**ON**
OFF

When this function is set to "ON", the TV screen becomes all blue in the following cases:

- When receiving a channel not in use.
- When stopping playback.

*NOTE:*

*When you want to receive an unstable channel with poor signals, set this function to "OFF".*

* The default setting is **bold** in the table below.

### ■ 2ND AUDIO RECORD

ON
**OFF**

**When this function is set to "ON";**

- If a SAP program is received, the SAP audio is recorded on both the normal and Hi-Fi tracks. The main audio is not recorded.
- If a non-SAP program is received, the main audio is recorded on both the Hi-Fi and normal tracks.

**When this function is set to "OFF",** the SAP audio cannot be recorded.

### ■ AUDIO MONITOR

| | |
|---|---|
| **HI-FI:** | Normally select this. Hi-Fi sound is played back. |
| HI-FI L: | Sound on the left Hi-Fi channel is played back. |
| HI-FI R: | Sound on the right Hi-Fi channel is played back. |
| NORM: | Sound on the normal track is played back. |
| NORM HI-FI: | Both sounds on the Hi-Fi track and normal track are mixed and played back. |

This VCR can record two sound tracks simultaneously (normal and Hi-Fi) on a Hi-Fi stereo tape.
You can select the sound track(s) to listen to while playing back a Hi-Fi stereo tape.
In addition, when playing back a prerecorded tape containing two separate audio programs on the Hi-Fi tracks, you can choose either one by selecting either "HI-FI L" or "HI-FI R".

*NOTES:*

- *While playing back a monaural tape, sounds on the normal track will be heard regardless of this setting.*
- *If RF connection (☞ pg. 6) is used for viewing pictures on the TV, sound will be monaural even though you select "HI-FI".*
- *You can also use the* **A. MONITOR** *button on the Remote to select the desired monitor sound. (☞ pg. 23)*

### ■ AV COMPU-LINK

**ON**
OFF

The REMOTE PAUSE/AV COMPULINK terminal on the rear panel can be used as either the REMOTE PAUSE terminal or the AV COMPULINK terminal.

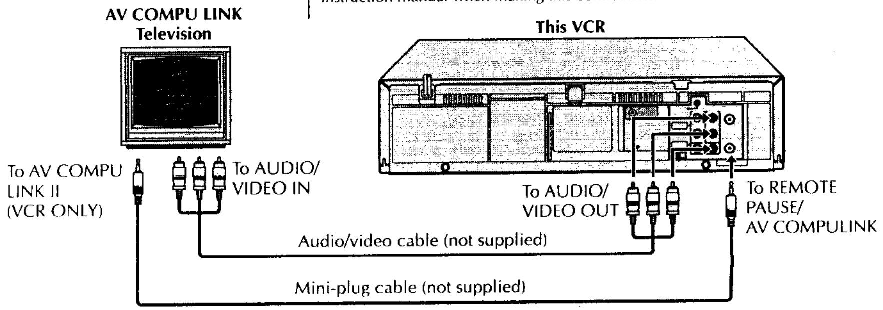
**When this function is set to "ON",** you can use the this terminal as the AV COMPULINK terminal.
By connecting other JVC's AV COMPULINK components (see the diagram below), including amplifiers (or receivers) and televisions, one touch control of the audio and video components linked via their AV COMPULINK connectors becomes possible.

**For example:** simply load a cassette in the VCR and press **PLAY ( ► )** and the AV COMPULINK components automatically turn on, the TV's AV mode is selected and the VCR starts playback. (You do not have to press **PLAY ( ► )** if the cassette's record safety tab is removed.)

**When this function is set to "OFF",** you can use this terminal as the REMOTE PAUSE terminal. (☞ pg. 43)

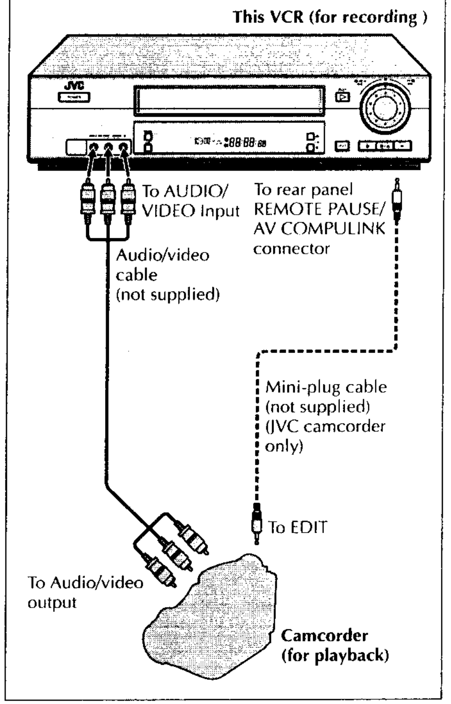
*NOTE:*

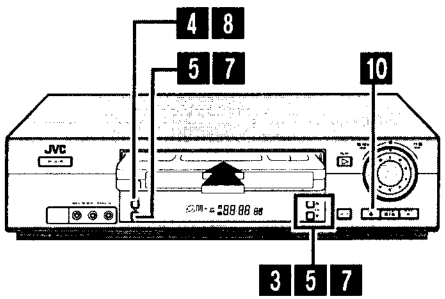
*Connection varies depending on the type of JVC TV you have. Refer to the TV's instruction manual when making this connection.*

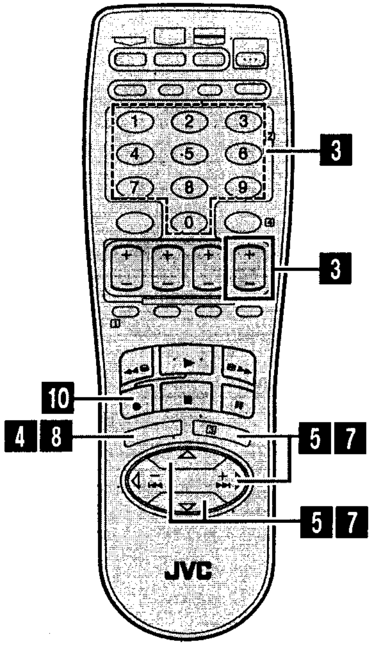

AV COMPU LINK
Television
This VCR
To AV COMPU LINK II (VCR ONLY)
To AUDIO/ VIDEO IN
To AUDIO/ VIDEO OUT
To REMOTE PAUSE/ AV COMPULINK
Audio/video cable (not supplied)
Mini-plug cable (not supplied)

# Edit From Camcorder

## Connection


This VCR (for recording )
To AUDIO/ VIDEO Input
To rear panel REMOTE PAUSE/ AV COMPULINK connector
Audio/video cable (not supplied)
Mini-plug cable (not supplied) (JVC camcorder only)
To EDIT
To Audio/video output
Camcorder (for playback)





You can use a camcorder as the playback VCR and your VCR as the recording VCR

### 1 Make connections

Connect an audio/video cable between the camcorder's audio/video output connectors and your VCR's video audio/video input connectors.

- When the JVC camcorder is equipped with the Master Edit Control, you can control the VCR from the camcorder. Connect the mini-plug cable (not supplied with this VCR) as illustrated to the left.
- When using a camcorder with a monaural output, connect the audio output connector on the camcorder to the left audio input connector on this VCR.

### 2 Load a cassette

Insert the cassette to be recorded on into this VCR (for recording).

### 3 Select input mode on this VCR

Select "L-1" — when connecting the camcorder to the audio/video input connectors on the rear panel.
Select "F-1" — when connecting the camcorder to the audio/video input connectors on the front panel.

**On the front panel:**
Press **CH▲▼**.

**On the Remote:**
Press the **Number** key **"0 (AUX)"** or **CH +/–**.

### 4 Access Main Menu screen on this VCR

Press **MENU**.

### 5 Access Function Set screen

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "FUNCTION SET", then press **OK**.

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS** ▷.

### 6 Select "EDIT" for Picture Control

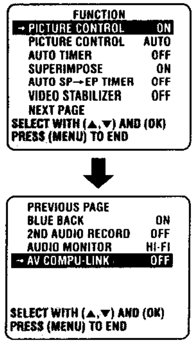
Follow the procedure described on pages 37 and 38.

**If your camcorder is a JVC Master Edit Control-equipped type — go to step 7.**
**If your camcorder is NOT a JVC Master Edit Control-equipped type — go to step 8.**

### 7 Enable remote pause function

**On the front panel:**
Press **CH▲▼** to move the highlight bar (arrow) to "AV COMPU-LINK", then press **OK** to set it to "OFF".

**On the Remote:**
Press **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "AV COMPU-LINK", then press **OK** or **SHUTTLE PLUS** ▷ to set it to "OFF".



```
            FUNCTION
→ PICTURE CONTROL           ON
  PICTURE CONTROL         AUTO
  AUTO TIMER               OFF
  SUPERIMPOSE               ON
  AUTO SP→EP TIMER         OFF
  VIDEO STABILIZER         OFF
  NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

```
  PREVIOUS PAGE
  BLUE BACK                 ON
  2ND AUDIO RECORD         OFF
  AUDIO MONITOR          HI-FI
→ AV COMPU-LINK            OFF


SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

- The REMOTE PAUSE/ AV COMPU-LINK connector works as the AV Compulink connector when "AV COMPU-LINK" is set to "ON" (☞ pg. 38 and 41), and works as the Remote Pause connector when "AV COMPU-LINK" is set to "OFF".

### 8 Return to normal screen

Press **MENU**.

### 9 Start playback

Press **PLAY ( ► )** on the camcorder.

*NOTE:*

*If the camcorder is equipped with a superimpose/OSD disable feature then set it to "OFF" before starting playback.*

### 10 Start recording

**On the front panel:**
Press **REC ( ● )**.

**On the Remote:**
Press **REC ( ● )** and **PLAY ( ► )** at the same time.

- If you are using a Master Edit Control-equipped JVC camcorder, recording starts automatically on this VCR. (Refer to camcorder's instruction manual.)

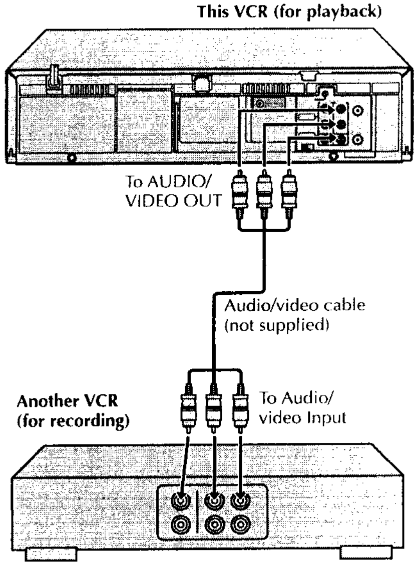
*NOTE:*

*Be sure to select "AUTO" for "PICTURE CONTROL" (or "NORM" when "AUTO PICTURE" is set to "OFF") after you finish dubbing the tapes (☞ pg. 38 and 39).*

# Edit To Or From Another VCR

## Connection

Ex. When using this VCR as the playback VCR



You can use your VCR as the playback or recording VCR.

- Refer also to the other VCR's instruction manual for connection and its operations.

### 1 Make connections

Connect an audio/video cable between the playback VCR's audio/video output connectors and the recording VCR's audio/video input connectors.

- When using this VCR as the recording VCR, connect this VCR's audio/video input connectors to the audio/video output connectors on the other VCR.
  If the playback VCR is monaural, connect the audio output connector on the playback VCR to the left audio input connector on this VCR.

### 2 Load cassettes

Insert the playback cassette into the playback VCR and the cassette to be recorded on into the recording VCR.

### 3 Select input mode on recording VCR

Select the correct external input on the other VCR.

- On this VCR (when using this VCR as the recording VCR);
  Select "L-1" — when connecting the camcorder to the audio/video input connectors on the rear panel;
  Select "F-1" — when connecting the camcorder to the audio/video input connectors on the front panel.

  **On the front panel:**
  Press **CH▲▼**.

  **On the Remote:**
  Press the **Number** key **"0 (AUX)"** or **CH +/–**.

### 4 Select EDIT function

Set the EDIT function to "ON".

- ON this VCR, follow the procedure described on pages 38 and 39.

### 5 Start playback

Press **PLAY ( ► )** on the playback VCR.

*NOTE:*

*If the playback VCR is equipped with a superimpose/ OSD disable feature then set it to "OFF" before starting playback (☞ pg. 38 and 39).*

### 6 Start recording

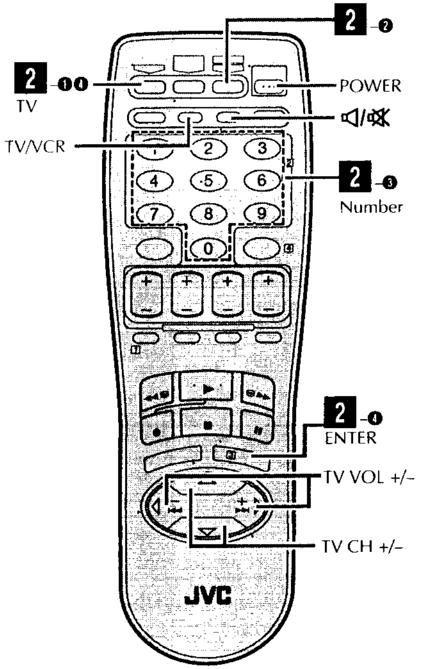
Press **REC ( ● )** on the recording VCR.

*NOTE:*

*Be sure to select "AUTO" for "PICTURE CONTROL" (or "NORM" when "AUTO PICTURE" is set to "OFF") after you finish dubbing the tapes (☞ pg. 38 and 39).*

---

# TV Brand Setting



| TV BRAND NAME | BRAND CODE |
|---|---|
| JVC | 01, 03 |
| HITACHI | 10 |
| MAGNAVOX | 02 |
| MITSUBISHI | 03 |
| PANASONIC | 04, 11 |
| RCA | 05 |
| SHARP | 06 |
| SONY | 07 |
| SAMSUNG | 12 |
| SANYO | 13 |
| SEARS | 13 |
| TOSHIBA | 08 |
| ZENITH | 09 |

This Remote can control some functions of remote controllable TVs listed below. Without setting, you can control a JVC TV.

### 1 Turn on the TV

Turn on the TV using the Power button on the TV or its Remote.

### 2 Set TV brand code

Follow the example shown below.

❶ Press and hold **TV**.
❷ Press **MBR SET**.
❸ Press the **Number** keys to enter your TV's brand code by referring to the table below.
❹ Press **OK**, and release **TV**.
The TV should turn off. If it does, try other operations below. (☞ step 3).

- Once you have set the Remote to operate the TV, you do not have to set it until you replace the batteries from the Remote.
- PANASONIC has two codes. If the TV does not function with one code, try entering the other.

### 3 Operate TV

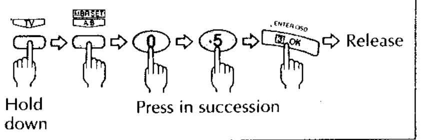
While holding down **TV**, press one of the following buttons: **POWER**, **TV/VCR**, **TV CH +/–**, **TV/VCR**, **◁/🔇** (TV Muting), **TV VOL +/–**, and **Number** keys.

- For some brands, you must press **ENTER** after having pressed the **Number** keys to enter a channel number.

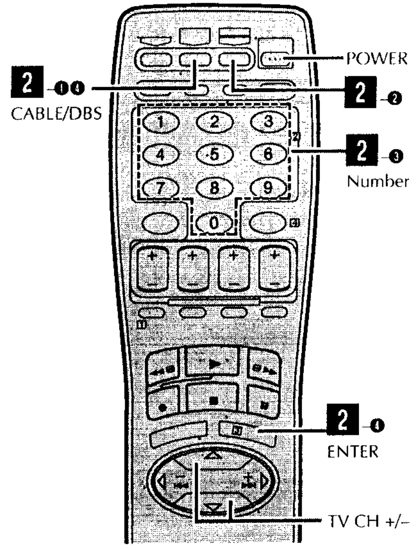
*NOTES:*

- *Depending on the type of TV, some or all functions cannot be operated using this Remote.*
- *It's not possible to operate a TV not equipped with a remote sensor.*

**(Ex.) To set Remote to RCA 05:**



# Cable Box Brand Setting



| CABLE BOX BRAND NAME | BRAND CODE |
|---|---|
| ARCHER | 01, 05, 17 |
| CABLETENNA | 01, 17 |
| CABLEVIEW | 15, 16, 17, 21, 25 |
| CITIZEN | 15, 16, 17, 21, 25 |
| CURTIS | 02 |
| DIAMOND | 01, 17 |
| EASTERN | 19 |
| GC BRAND | 15, 16, 17, 21, 25 |
| GEMINI | 15 |
| GENERAL INSTRUMENTS | 01, 04, 06, 11, 12, 15, 28 |
| HAMLIN | 10, 18, 19, 23 |
| JASCO | 15 |
| JERROLD | 01, 04, 06, 11, 12, 15, 28 |
| NOVAVISION | 02 |
| OAK | 07 |
| PANASONIC | 13, 14 |
| PULSER | 15, 16, 17, 21, 25 |
| RCA | 13, 14 |
| REGAL | 10, 18, 19, 23 |
| REGENCY | 19 |
| REMBRANDT | 01, 16, 17 |
| SAMSUNG | 05, 16, 24 |
| SCIENTIFIC ATLANTA | 02 |
| SIGMA | 07 |
| SL MARX | 05, 16, 17, 24, 25 |
| SPRUCER | 13, 14 |
| STARGATE | 05, 15, 16, 17, 21, 24, 25 |
| TELEVIEW | 05, 16, 24 |
| TOCOM | 01, 04, 16 |
| UNIKA | 01, 17 |
| UNIVERSAL | 16, 17, 25 |
| VIDEOWAY | 03, 09, 22 |
| ZENITH | 03, 09, 22 |

This Remote can control some functions of the cable boxes listed below. Some cable box brands have more than one code. If your cable box does not function with a specified code, try other codes.

## 1 Turn on the cable box

Turn on the cable box using the Power button on the cable box or its Remote.

## 2 Enter cable box brand code

Follow the example shown below.

❶ Press and hold **CABLE/DBS**.
❷ Press **MBR SET**.
❸ Press the **Number** keys to enter your cable box's brand code by referring to the table below.
❹ Press **OK**, and release **CABLE/DBS**.
The cable box should turn off. If it does, try other operations below. (☞ step 3).

- Once you have set the Remote to operate the cable box, you do not have to set it until you replace the batteries from the Remote.

## 3 Operate cable box

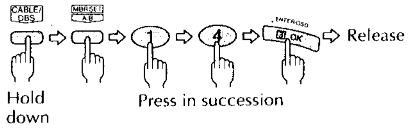
While holding down **CABLE/DBS**, press one of the following buttons: **POWER**, **TV CH +/–**, and **Number** keys.

- For some brands, you must press **ENTER** after having pressed the **Number** keys to enter a channel number.
- To change the cable box's channels, press **TV CH +/–** or the **Number** keys. (The **CH +/–** button can be used to change the VCR's channels only.)

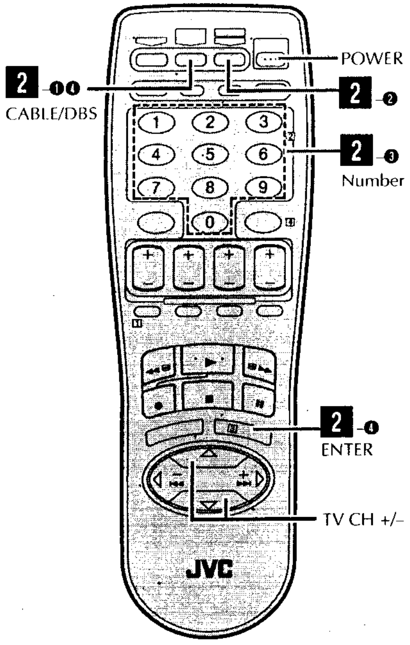
*NOTES:*

- *Depending on the type of cable box, some or all functions cannot be operated using this Remote.*
- *It's not possible to operate a cable box not equipped with a remote sensor.*
- *It's not possible to set the Remote for both your cable box and a DBS receiver at the same time. You can only set the Remote to operate one of these units at a time.*

**(Ex.) To set the Remote to RCA 14:**



# DBS Receiver Brand Setting



| DBS BRAND NAME | BRAND CODE |
|---|---|
| JVC (DISH Network) | 51 |
| ECHOSTAR (DISH Network) | 51 |
| PRIMESTAR | 50 |
| SONY (DSS) | 41 |
| RCA (DSS) | 40 |

This Remote can control some functions of the DBS (Direct Broadcast Satellite) receivers listed below.

## 1 Turn on the DBS receiver

Turn on the DBS receiver using the Power button on the DBS receiver or its Remote.

## 2 Enter DBS receiver brand code

Follow the example shown below.

❶ Press and hold **CABLE/DBS**.
❷ Press **MBR SET**.
❸ Press the **Number** keys to enter your DBS receiver's brand code by referring to the table below.
❹ Press **OK**, and release **CABLE/DBS**.
The DBS receiver should turn off. If it does, try other operations below (☞ step 3).

- Once you have set the Remote to operate the DBS receiver, you do not have to set it until you replace the batteries from the Remote.

## 3 Operate DBS receiver

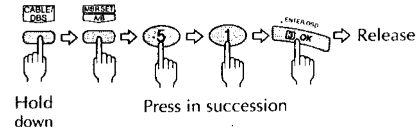
While holding down **CABLE/DBS**, press one of the following buttons: **POWER**, **TV CH +/–**, and **Number** keys.

- For some brands, you must press **ENTER** after having pressed the **Number** keys to enter a channel number.
- To change the DBS receiver's channels, press **TV CH +/–** or the **Number** keys. (The **CH +/–** button can be used to change the VCR's channels only.)

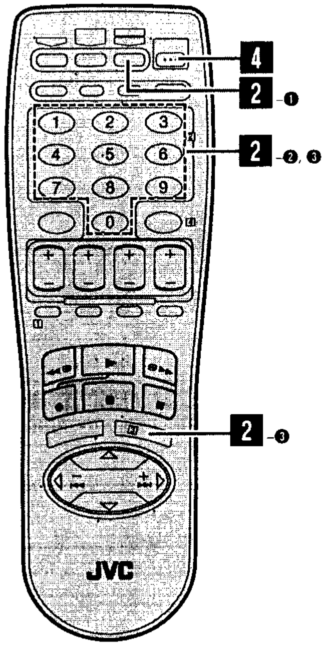
*NOTES:*

- *Depending on the type of DBS receiver, some or all functions cannot be operated using this Remote.*
- *It's not possible to operate a DBS receiver not equipped with a remote sensor.*
- *It's not possible to set the Remote for both your DBS receiver and a cable box at the same time. You can only set the Remote to operate one of these units at a time.*

**(Ex.) To set the Remote to JVC 51:**



# Changing Remote Control Code



This Remote is capable of transmitting two control codes; one set to respond to A code control signals and another set to respond to B code control signals.
This Remote control is preset to send A code signals because your VCR is initially set to respond to A code signals. You can easily modify your VCR and the Remote to respond to B code signals.
When using two JVC VCRs, set two VCRs and their Remotes to different codes, so that you can operate these VCRs separately.

### 1 Unplug VCR

Unplug the AC power cord from the AC outlet.

### 2 Set remote control code for Remote

❶ Press and hold **A/B**.
❷ Press the **Number** key "2".
❸ Press **OK**, and release **A/B**.

- The Remote now can transmit B code control signals.

### 3 Plug in VCR

Plug the AC power cord back into an AC outlet.

### 4 Turn on VCR

Press **POWER** on the Remote.

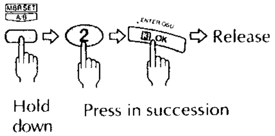
- The VCR now responds to B code control signals.
- To set the Remote and the VCR back to A code control signals, repeat the same procedure as shown above except pressing the **Number** key "1" in step 2.

### To control two VCRs with the same Remote

You can control two JVC VCRs by switching the remote control code for the Remote between A and B (☞ step 2), keeping two VCRs to different control codes.

- Press the **Number** key "1" for A code control signals and the **Number** key "2" for B code control signals. (To change only the remote control code for the Remote, DO NOT perform steps 1, 3, and 4.)

**(Ex.) To set Remote to B code:**



Before requesting service, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your VCR off for repair.

## POWER

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. The power will not come on. | • The AC power cord is disconnected. | Connect the AC power cord. |
| 2. The clock works, but the VCR's power will not come on. | • The VCR is in the timer recording standby mode with "AUTO TIMER" set to "OFF" (☞ pg. 39). | Press **TIMER** to disengage. |
| 3. The Remote will not function. | • The batteries are discharged. | Replace the dead batteries with new ones. |

## TAPE TRANSPORT

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. The cassette gets stuck partway during loading, and is ejected. | • The cassette was inserted incorrectly. | Make sure the cassette's window is facing up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR. Then insert the cassette. |

## PLAYBACK

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. The tape is running but the picture will not appear. | • If the RF connection (☞ pg. 6) is used to view the picture, the channel on the TV is set incorrectly.<br>• If the AV connection (☞ pg. 6) is used to view the picture, the TV receiver is set to the wrong mode. | Select channel 3 or 4 on the TV.<br>Select the AV mode on the TV. |
| 2. Breaks are noticeable in Hi-Fi sound track. | • Automatic tracking is engaged. | Disengage auto tracking and adjust the tracking manually (☞ pg. 23). |
| 3. The playback picture is blurred or interrupted, even though TV broadcasts are clear. | • The video heads may be dirty. | The heads must be cleaned. Consult your JVC dealer. |
| 4. The Hi-Fi sound cannot be heard. | • Audio Monitor setting is incorrect. | Set Audio Monitor to "HI-FI" (☞ pg. 23 or 41). |

## RECORDING

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. Recording will not start. | • There is no cassette loaded.<br>• The loaded cassette has had its record safety tab removed. | Insert a cassette.<br>Remove the cassette and cover the hole with adhesive tape, or load a cassette on which the record safety tab is intact. |
| 2. TV broadcasts will not be recorded properly. | • The VCR has been set to "L-1" or "F-1" input mode by mistake. | Select the appropriate channel on the VCR. |
| 3. Tape-to-tape editing will not work. | • The VCRs or the camcorder and the VCR have been incorrectly connected.<br>• The power to one or more of the units has not been turned on.<br>• The recording VCR's input mode has been set incorrectly. | Refer to the directions and the illustration under "Edit From Camcorder" (☞ pg. 42) or "Edit To Or From Another VCR" (☞ pg. 44) and properly connect the units.<br>Make sure the power to all units is on.<br>Select the appropriate input mode on the recording VCR. |

## TIMER RECORDING

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. Timer recording will not work. | ● The clock and/or the timer have been set incorrectly.<br>● The timer is not engaged.<br>● The VCR has not been set up properly. | Set the clock and/or timer correctly.<br>Press **TIMER** and check to make sure that ◷ appears on the front display panel.<br>Re-perform the set-up procedures. Make sure you have compensated for guide channel and VCR or cable box channel number mismatches (☞ pg. 32). |
| 2. Timer programing will not work. | ● Timer recording is in progress. | Timer programing cannot be performed when timer recording is in progress. Wait until it finishes. |
| 3. ◷ and 📼 on the front display panel will not stop blinking. | ● The timer is engaged but there is no cassette loaded. | Load a cassette with the record safety tab intact, or with the hole covered with adhesive tape. |
| 4. The cassette is automatically ejected, and ◷ and 📼 on the front display panel will not stop blinking. | ● The loaded cassette has had its record safety tab removed. | Remove the cassette and cover its hole with adhesive tape, or replace it with a cassette on which the safety tab is intact. |
| 5. ◷ blinks for 10 seconds and the timer mode is disengaged. | ● **TIMER** has been pressed when there are no programs in memory, or the timer recording program has not been set correctly. | Check the programed data and set again if necessary, then press **TIMER** again. |
| 6. The cassette is automatically ejected, the power shuts off and ◷ and 📼 will not stop blinking. | ● The tape reaches its end during timer recording. | The program may not have been recorded in its entirety. Next time be sure you have enough time on the tape to record the entire broadcast. |
| 7. Cable channels are not automatically switched during timer recording. | ● The Controller is not properly connected to the VCR.<br>● The output channel selected in the Cable Box Set screen is incorrect.<br>● The cable box is turned off. | Connect the Controller correctly (☞ pg. 15).<br>After confirming your cable box's output channel number, re-access the Cable Box Set screen and select the correct number (☞ pg. 16).<br>Make sure the power is on before timer recording starts. |
| 8. Satellite channels are not automatically switched during timer recording. | ● The Controller is not properly connected to the VCR.<br>● The output channel selected in the DBS Receiver Set screen is incorrect.<br>● The VCR is not set correctly to control the DBS receiver<br>● The DBS receiver is turned off. | Connect the Controller correctly (☞ pg. 18).<br>After confirming your DBS receiver's output channel number, re-access the DBS Receiver Set screen and select the correct number (☞ pg. 19).<br>Set the correct DBS receiver brand code (☞ pg. 20).<br>Make sure the power is on before timer recording starts. |
| 9. Timer recording begins as scheduled, but the channel is always incorrect. | ● Even though you do not use an external cable box or DBS receiver, "CABLE BOX SET" is set to "ON" or "DBS RECEIVER SET" is set to "ON". | Set "CABLE BOX SET" to "OFF" (☞ pg. 16) or "DBS RECEIVER SET" is set to "OFF" (☞ pg. 19). |
| 10. You moved, and now VCR Plus+ does not work properly. | ● The receivable stations in the new area are received on different channels than those in the previous area. | Re-perform the VCR Plus+ setup procedure (☞ pg. 32). |
| 11. "PROGRAM FULL" is displayed on the screen. | ● All 8 programs of the VCR's timer memory are used. | Wait until a space in memory clears, or cancel unnecessary program information (☞ pg. 36). |

CONTINUED ON NEXT PAGE ➡

## OTHER PROBLEMS

| SYMPTOM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|---|---|---|
| 1. When scanning channels, some of them are skipped over. | ● Those channels have been preset to be skipped. | If you need the skipped channels, restore them (☞ pg. 14). |
| 2. The channel cannot be changed. | ● Recording is in progress. | Press **PAUSE** ( **II** ) to pause the recording, change channels, then press **PLAY** ( ► ) to resume recording. |
| 3. The Remote will not operate your TV or cable box or DBS receiver. | ● The brand codes are set incorrectly. | Reset the correct brand codes (☞ pg. 45, 46 or 47). |
| 4. Even though Auto or Semiauto Clock Set has been performed, the clock is incorrect. | ● The clock setting data received from the host channel is incorrect. | Select a different host channel during Semiauto Clock Set (☞ pg. 11), or perform Manual Clock Set (☞ pg. 12). |

### MOISTURE CONDENSATION

Moisture in the air will condense on the VCR when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the VCR turned on for a few hours to evaporate the moisture before inserting a tape.

### ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

### ATTENTION

This VCR contains microcomputers. External electronic noise or interference can cause microcomputer to malfunction. If the VCR does not operate correctly switch its power off and unplug the AC power cord from the AC supply. Wait for a while and then plug the power back in. Eject and check the condition of the cassette. If everything appears normal, you can operate the VCR as usual.

## HOW TO LOCATE YOUR JVC SERVICE CENTER

**TOLL FREE: 1-800-252-5722**
**http://www.jvcservice.com**

**Dear customer:**

*In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, call 1-800-252-5722 for your authorized servicer. Remember to retain your Bill of Sale for Warranty Service.*

*— JVC*

### JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF JVC AMERICAS CORP.

FACTORY SERVICE CENTER LOCATIONS

10 New Maple Avenue
Pine Brook, NJ 07058-9641
(973) 396-1000

1500 Lakes Parkway
Lawrenceville, GA 30243-5857
(770) 339-2522

705 Enterprise Street
Aurora, IL 60504-8135
(630) 851-7855

5665 Corporate Avenue
Cypress, CA 90630-4727
(714) 229-8011

10700 Hammerly Boulevard, Suite 110
Houston, TX 77043-2310
(713) 935-9331

2969 Mapunapuna Place, Suite 105
Honolulu, HI 96819-2000
(808) 833-5828

13 Cummings Park
Woburn, MA 01801-2105
(781) 376-9100

8192 W State Road 84
Davie, FL 33324-4611
(954) 472-1960

890 Dubuque Avenue
South San Francisco, CA 94080-1804
(650) 871-2666

*Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.*

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF JVC AMERICAS CORP.
10 New Maple Avenue
Pine Brook, NJ 07058-9641

### *If you ship the product...*

*Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and the inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.*

### *ACCESSORIES*

*To purchase accessories for your JVC product, you may contact your local JVC Dealer.*
*Or from the 48 Continental United States call toll free: 1-800-882-2345.*

### *Don't service it yourself.*

**CAUTION**
*To prevent electrical shock, do not open the cabinet.*
*No user serviceable parts inside.*
*Refer servicing to qualified service personnel.*

---

## LIMITED WARRANTY

**CONSUMER VIDEO 1-90**

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period as shown below. ("The Warranty Period")

| PARTS | LABOR |
|---|---|
| **1** YR | **90** DAYS |

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN COMMONWEALTH OF PUERTO RICO.

**WHAT WE WILL DO:**
If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis except for Television sets having a screen size 25 inches and above which are covered on an in-home basis.

**WHAT YOU MUST DO FOR WARRANTY SERVICE:**
Return your product to a JVC authorized service center with a copy of your bill of sale. For your nearest JVC authorized service center, please call toll free: (800) 252-5722.

If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location of which will be given to you by the toll-free number.

If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

**WHAT IS NOT COVERED:**
This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to act of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus (Needle) are covered for 90 days from the date of purchase;
7. Accessories;
8. Batteries (except that Rechargeable Batteries are covered for 90 days from the date of purchase); from the date of purchase);

There are no other express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential damages or limitations on how long an implied warranty lasts, so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

JVC COMPANY OF AMERICA
DIVISION OF JVC AMERICAS CORP.

1700 Valley Road
Wayne, New Jersey 07470

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY, THIS WARRANTY DOES NOT APPLY. FOR DETAILS OF REFURBISHED PRODUCT WARRANTY, PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

**For customer use:**
Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

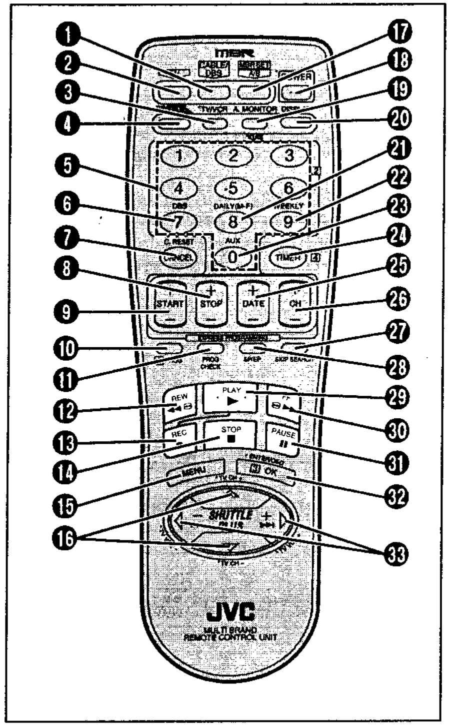
Model No.: ______________________

Serial No.: ______________________

Purchase date: ______________________

Name of dealer: ______________________

## Remote



① CABLE/DBS button : ☞ pg. 46
② TV button: ☞ pg. 45
③ TV/VCR button : ☞ pg. 25, 26, 45
④ REVIEW button : ☞ pg. 24
⑤ Number buttons : ☞ pg. 25, 30, 33
⑥ DBS button : ☞ pg. 35
⑦ CANCEL button : ☞ pg. 31, 36
C. (Counter) RESET button : ☞ pg. 22, 26
⑧ STOP +/– button : ☞ pg. 31, 34
⑨ START +/– button : ☞ pg. 34
⑩ PROG. (Program) button : ☞ pg. 30, 34
⑪ PROG. CHECK button : ☞ pg. 36
⑫ REW ( ⏪ ◀◀ ) button : ☞ pg. 21, 25, 28
⑬ REC ( ● ) button : ☞ pg. 25
⑭ STOP ( ■ ) button : ☞ pg. 21, 25
⑮ MENU button
⑯ SHUTTLE PLUS △▽ buttons
TV CH +/– buttons : ☞ pg. 45, 46, 47
⑰ MBR SET button : ☞ pg. 45, 46, 47
A/B button : ☞ pg. 48
⑱ POWER button : ☞ pg. 21, 25
⑲ A. (Audio) MONITOR button : ☞ pg. 23
🔈/🔇 (TV Muting) button : ☞ pg. 45
⑳ DISPLAY button : ☞ pg. 22, 26
㉑ DAILY (M-F) button : ☞ pg. 31, 35
㉒ WEEKLY button : ☞ pg. 31, 35
㉓ AUX button : ☞ pg. 43, 44
㉔ TIMER button : ☞ pg. 31, 35, 36
㉕ DATE +/– button : ☞ pg. 34
㉖ CH +/– button : ☞ pg. 25, 34
㉗ SKIP SEARCH button : ☞ pg. 29
㉘ SP/EP button : ☞ pg. 25, 31, 35
㉙ PLAY ( ▶ ) button: ☞ pg. 21, 25
㉚ FF ( ⏩ ▶▶ ) button: ☞ pg. 21, 25, 28
㉛ PAUSE ( ❚❚ ) button: ☞ pg. 25, 29
㉜ OK button
ENTER button : ☞ pg. 45, 46, 47
OSD button : ☞ pg. 27
㉝ SHUTTLE PLUS ⏮ ⏭ (◁ ▷) button
: ☞ pg. 29
TV VOL.+/– button : ☞ pg. 45

The glow-in-the-dark buttons shown in white on the illustration above are helpful when using the Remote in darkened rooms.

Buttons with a small dot on the left side of the name can also be used to operate your TV while holding down **TV** on the Remote. (☞ pg. 45).

**How to use the Remote**

Before use, insert two AA size batteries into the Remote with the polarity (⊕ and ⊖) matched correctly as indicated on the battery compartment or on the lid.

The Remote can operate most of your VCR's functions, as well as basic functions of TV sets, cable boxes and DBS receivers.

- Point the Remote toward the remote sensor on the target component.
- The maximum operating distance of the remote control is about 8 m.

*NOTE:*

*If the Remote does not work properly, remove its batteries, wait for a few seconds, replace the batteries and then try again.*

## SPECIFICATIONS

### GENERAL

| | |
|---|---|
| Power requirement | : AC 120 V∿ , 60 Hz |
| Power consumption | |
| Power on | : 19 W |
| Power off | : 2.5 W |
| Temperature | |
| Operating | : 5°C to 40°C (41°F to 104°F) |
| Storage | : –20°C to 60°C (–4°F to140°F) |
| Operating position | : Horizontal only |
| Dimensions (W x H x D) | : 400 x 94 x 281 mm<br>(15-3/4" x 3-3/4" x 11-1/8") |
| Weight | : 3.2 kg (7.1 lbs) |
| Format | : VHS NTSC standard |
| Maximum recording time | |
| SP | : 210 min. with ST-210 video cassette |
| EP | : 630 min. with ST-210 video cassette |

### VIDEO/AUDIO

| | |
|---|---|
| Signal system | : NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields |
| Recording/ Playback system | : DA-4 (Double Azimuth) head helical scan system |
| Signal-to-noise ratio | : 45 dB |
| Horizontal resolution | : 230 lines (VHS) |
| Frequency range | |
| Normal audio | : 70 Hz to 10,000 Hz |
| Hi-Fi audio | : 20 Hz to 20,000 Hz |
| Input/Output | : RCA connectors<br>(IN x 2, OUT x 1) |

### TUNER

| | |
|---|---|
| Tuning system | : Frequency-synthesized tuner |
| Channel coverage | |
| VHF | : Channels 2–13 |
| UHF | : Channels 14–69 |
| CATV | : 113 Channels |
| RF output | : Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced |

### TIMER

| | |
|---|---|
| Clock reference | : Quartz |
| Program capacity | : 1-year programmable timer/ 8 programs |
| Memory backup time | : Approx. 3 min. |

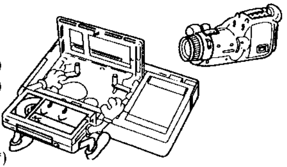
### ACCESSORIES

| | |
|---|---|
| Provided accessories | : RF cable (F-type),<br>Infrared remote control unit,<br>"AA" battery x 2 |

*Specifications shown are for SP mode unless specified otherwise.*
*E. & O.E. Design and specifications subject to change without notice.*

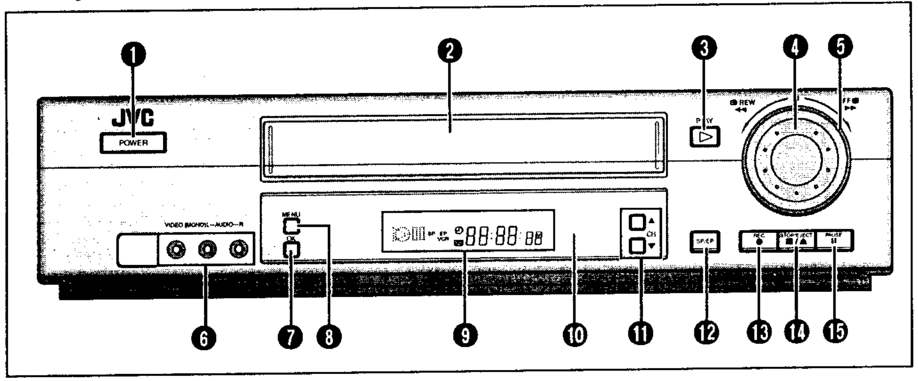
**Usable cassettes**
Full-Size VHS
T-30 (ST-30**)
T-60 (ST-60**)
T-90
T-120 (ST-120**)
T-160 (ST-160**)
ST-210**

Compact VHS*
TC-20 (ST-C20**)
TC-30 (ST-C30**)
TC-40 (ST-C40**)



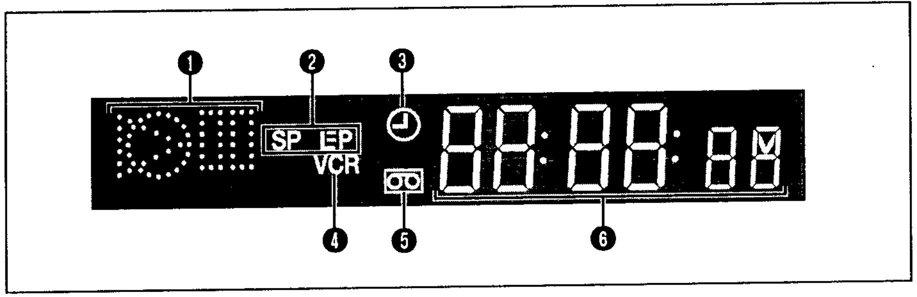
* Compact VHS camcorder recordings can be played on this VCR. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
** This VCR can record on regular VHS and Super VHS cassettes. However, it will record regular VHS signals only.

## Front panel


❶
❷
❸
❹
❺
JVC
POWER
PLAY
REW
FF
VIDEO (MONO)L—AUDIO—R
MENU
OK
CH
SP/EP
REC
STOP/EJECT
PAUSE
❻
❼
❽
❾
❿
⓫
⓬
⓭
⓮
⓯

❶ POWER button : ☞ pg. 21, 25
❷ Cassette loading slot
❸ PLAY ( ▷ ) button : ☞ pg. 21
❹ JOG dial : ☞ pg. 29
❺ SHUTTLE ring : ☞ pg. 21, 25, 28
❻ AUDIO/VIDEO input connectors : ☞ pg. 42
❼ OK button
❽ MENU button
❾ Front display panel : ☞ below
❿ Remote sensor
⓫ CH ▲▼ buttons : ☞ pg. 25
⓬ SP/EP button : ☞ pg. 25
⓭ REC ( ● ) button : ☞ pg. 25, 26
⓮ STOP/EJECT ( ■ / ▲ ) button : ☞ pg. 21, 25
⓯ PAUSE ( ❚❚ ) button : ☞ pg. 25, 29

## Front display panel

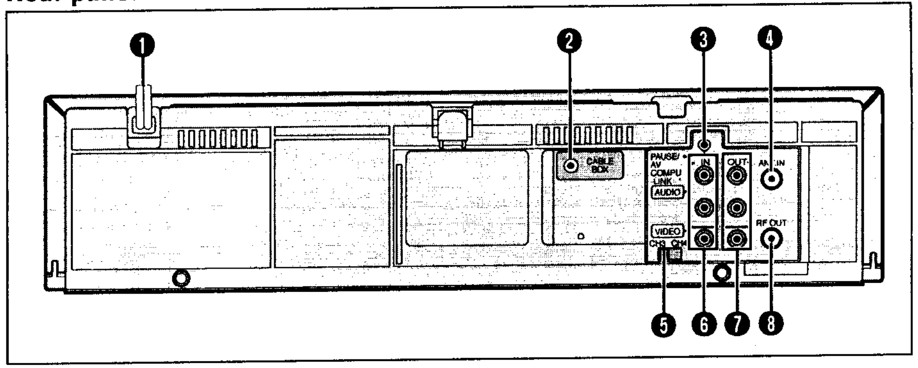

❶
❷
❸
SP EP
VCR
88:88:88
❹
❺
❻

❶ Symbolic Mode Indicators

| | | | |
|---|---|---|---|
| PLAY:<br>FF/REW VARIABLE<br>SHUTTLE SEARCH: | ▷ | STILL:<br>SLOW: | ▷▦ |
| | | RECORD: | ○ |
| | | RECORD PAUSE: | ○▦ |

❷ Tape speed indicators
❸ Timer mode indicator : ☞ pg. 31, 35
❹ VCR mode indicator : ☞ pg. 25, 26
❺ Cassette mark
❻ Channel and auxiliary input ("L-1" and "F-1")
Counter reading : ☞ pg. 22, 26
Clock time : ☞ pg. 22, 26

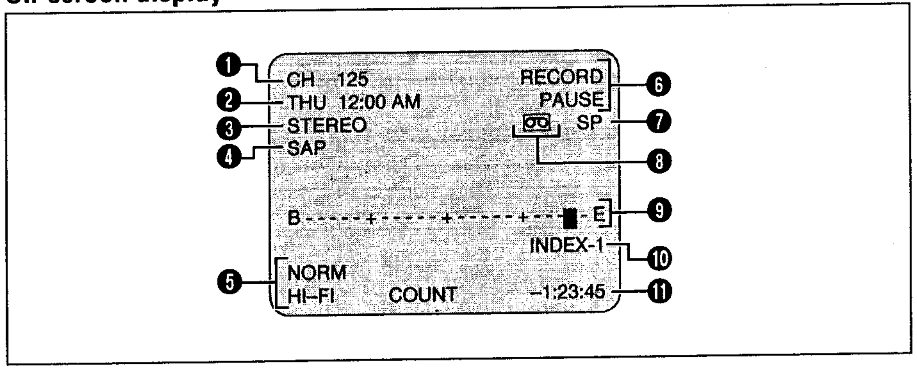
## Rear panel


❶
❷
❸
❹
CABLE BOX
PAUSE/AV COMPU LINK
AUDIO
VIDEO
IN
OUT
ANT. IN
RF OUT
CH3 CH4
❺
❻
❼
❽

❶ AC power cord : ☞ pg. 6
❷ CABLE BOX Controller connector :
☞ pg. 15, 18
❸ REMOTE PAUSE/AV COMPULINK terminal
- REMOTE PAUSE terminal : ☞ pg. 41, 42
- AV COMPULINK terminal : ☞ pg. 41

❹ ANT. (Antenna) IN terminal : ☞ pg. 6
❺ CH3-CH4 switch : ☞ pg. 7
❻ AUDIO/VIDEO IN connectors : ☞ pg. 44
❼ AUDIO/VIDEO OUT connectors : ☞ pg. 44
❽ RF OUT terminal : ☞ pg. 6

## On-screen display


❶ CH 125
❷ THU 12:00 AM
❸ STEREO
❹ SAP
RECORD ❻
PAUSE
SP ❼
❽
B - - - - - + - - - - - + - - - - - + - - ▮ - E ❾
INDEX-1 ❿
❺ NORM
HI-FI
COUNT
–1:23:45 ⓫

❶ Channel and auxiliary input ("L-1" and "F-1")
❷ Date and clock time : ☞ pg. 22, 26
❸ STEREO program indication : ☞ pg. 27
❹ SAP (Second Audio Program) indication :
☞ pg. 27
❺ Audio monitor indications : ☞ pg. 23, 41
❻ VCR operation mode indication
❼ Tape speed indication
❽ Cassette indication
❾ Tape position indicator : ☞ pg. 22
❿ Index no. indication : ☞ pg. 24
⓫ Time counter : ☞ pg. 22, 26

## Questions and answers

### PLAYBACK

**Q. What happens if the tape reaches its end during playback or search?**

A. The VCR automatically rewinds it to the beginning.

**Q. Can the VCR indefinitely remain in still mode?**

A. No. It stops automatically after 5 minutes to protect the heads.

**Q. During picture search, still picture playback and frame-by-frame playback, the picture is intermittent. What's the cause?**

A. Picture loss occurs when these types of playback are attempted with a tape recorded in LP mode. Pressing **PLAY** (▶) to return to normal playback will restore the picture.

**Q. When returning from variable-speed picture search to normal playback, the picture is disturbed. Should I be concerned about this?**

A. No, it is normal.

**Q. When playing back programs that have been timer-recorded consecutively (such one program from 8:00 to 9:00 and another one from 9:00 to 10:00), the picture and sound become momentarily distorted where the first program ends and the second program begins. Is this a malfunction?**

A. No. This is normal.

**Q. Other than preventing further recording, what effect does removing the safety tab have?**

A. It disables marking of index codes.

**Q. Sometimes, during index search, the VCR cannot find the program I want to see. Why not?**

A. There may be index codes too close together.

**Q. During playback, on-screen display sometimes jitters. Why does this happen?**

A. If the condition of the tape being played back is not good, jittering of the video (including on-screen display) may occur.

### RECORDING

**Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the new recording. Why does this happen?**

A. This is normal. It reduces distortion at the pause and resume points.

**Q. Can the VCR indefinitely remain in the recording pause mode?**

A. No. The VCR automatically stops after 5 minutes to protect the heads. When paused during Instant Timer Recording (ITR), the VCR shuts off automatically after 5 minutes.

**Q. What happens if the tape reaches its end during recording?**

A. The VCR automatically rewinds it to the beginning.

### TIMER RECORDING

**Q. REC and 🕘 remain lit on the front display panel. Is there a problem?**

A. No. This is a normal condition for a timer recording in progress.

**Q. Can I program the timer while I'm watching a tape or a TV broadcast?**

A. Yes, but while you are setting the timer you will not see the tape's or broadcast program's picture as it is replaced by the on-screen menu. (The sound from the tape or broadcast program will be heard during the timer setting.)

## List of terms

This guide serves as a quick way to locate frequently used terms and on-screen display names.

**A**

Accidental erasure prevention 25
Audio Monitor 23, 41
Auto Channel Set 13
Auto Daylight Saving Time 11
Auto Picture 39
Auto SP→EP Timer 40
Auto Timer 39
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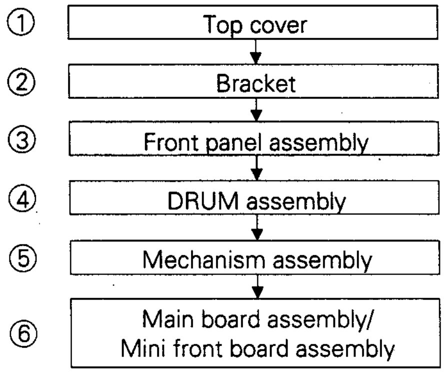
# SECTION 1
# DISASSEMBLY

## 1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



## 1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

| STEP /LOC NO. | PART NAME | FIG. NO. | POINT | NOTE |
|---|---|---|---|---|
| ① | TOP COVER | D1 | 3(S1) | |
| ② | BRACKET | D2 | 2(S2) | |
| ③ | FRONT PANEL ASSEMBLY | D3 | 7(L3),<br>CN7001(WR3)<br>[HR-VP780U/U(C)] | <NOTE 3a><br><NOTE 3b><br><NOTE 3c> |

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.

(2) Part name to be removed or installed.

(3) Fig.No. showing procedure or part location

(4) Identification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, CNxx(WRxx) = Remove the wire (WRxx) from the connector (CNxx).

**NOTE:** *The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.*

(5) Adjustment information for installation

## 1.3 DISASSEMBLY/ASSEMBLY METHOD

| STEP /LOC NO. | PART NAME | FIG. NO. | POINT | NOTE |
|---|---|---|---|---|
| ① | TOP COVER | D1 | 3(S1) | |
| ② | BRACKET | D2 | 2(S2) | |
| ③ | FRONT PANEL ASSEMBLY | D3 | 7(L3),<br>CN7001(WR3)<br>[HR-VP780U/U(C)] | <NOTE 3a><br><NOTE 3b><br><NOTE 3c> |
| ④ | DRUM ASSEMBLY | D4 | 3(S4),CN1(WR4a)<br>CN1(WR4b) | <NOTE 3c> |
| ⑤ | MECHANISM ASSEMBLY | D5 | 2(S5a), 2(S5b),<br>2(L5), CN1(WR5) | <NOTE 3c><br><NOTE 5a><br><NOTE 5b><br><NOTE 5c> |
| ⑥ | MAIN BOARD ASSEMBLY/<br>MINI FRONT BOARD ASSEMBLY<br>[HR-VP68U/U(C) & HR-VP680U/U(C)] | D6 | (S6),<br>6(L6a)<br>[HR-VP68U/U(C) & HR-VP680U/U(C)],<br>3(L6a)<br>[HR-VP680U/U(C)],<br>(L6b)<br>[HR-VP68U/U(C) & HR-VP680U/U(C)],<br>CN7001(WR6)<br>[HR-VP68U/U(C) & HR-VP680U/U(C)] | <NOTE 3c><br><NOTE 6> |

<NOTE3a>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE3b>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob ⓑ of the Main board assembly from the side.
(If the switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3c>
Be careful not to damage the connector and wire etc. during connection and disconnection.
When connecting the wire to the connector, be careful with the wire direction.

<NOTE5a>
When it is required to remove the screws (S5a) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly"(See on pages 1-3).

<NOTE5b>
When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.

<NOTE5c>
When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board assembly (D3001: LED, Q3001: Start sensor, Q3002: End sensor).

<NOTE6>
When removing the PC Support from the bottom chassis, take care not to damage the locking portion of the PC Support.

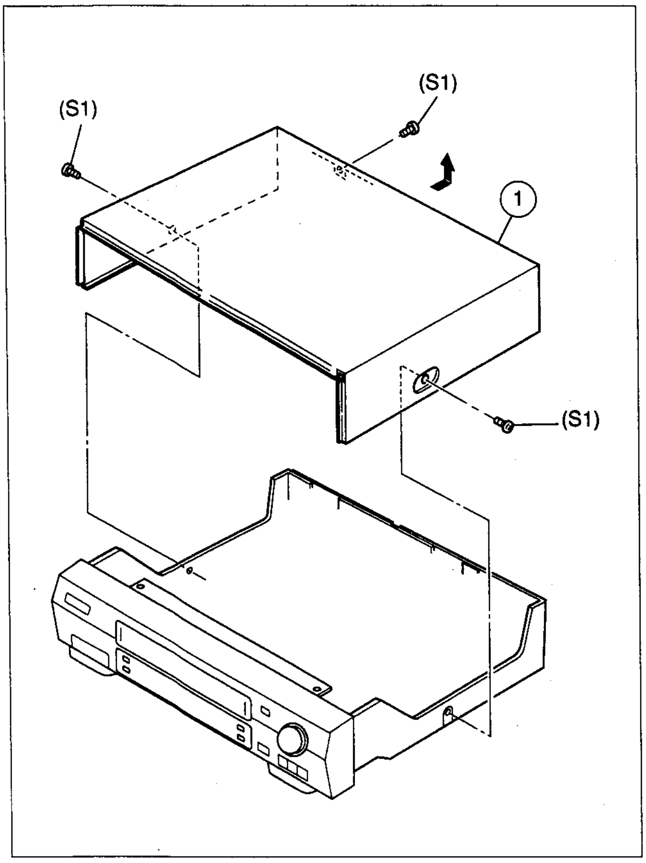


Fig. D1

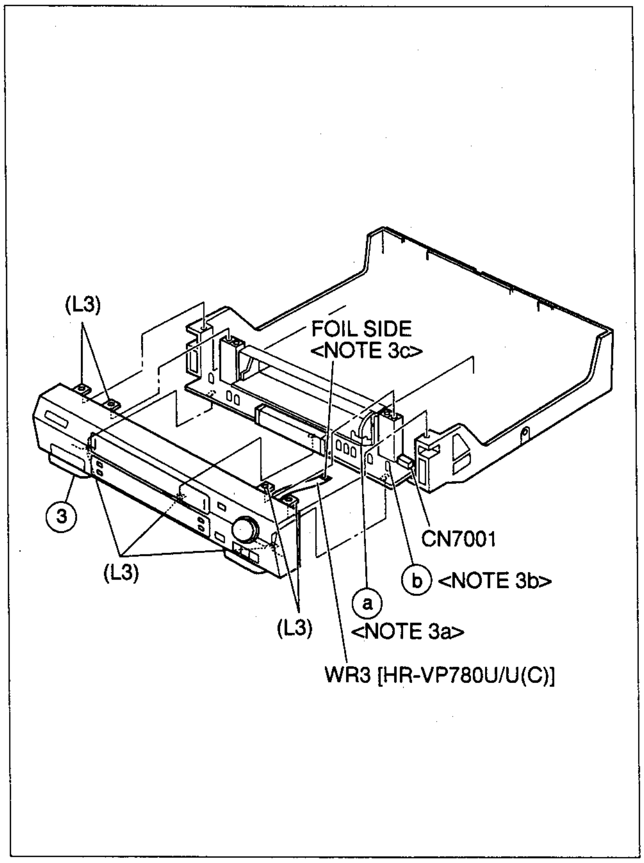

(L3)
FOIL SIDE
<NOTE 3c>
3
(L3)
CN7001
b <NOTE 3b>
a
(L3)
<NOTE 3a>
WR3 [HR-VP780U/U(C)]

Fig. D3

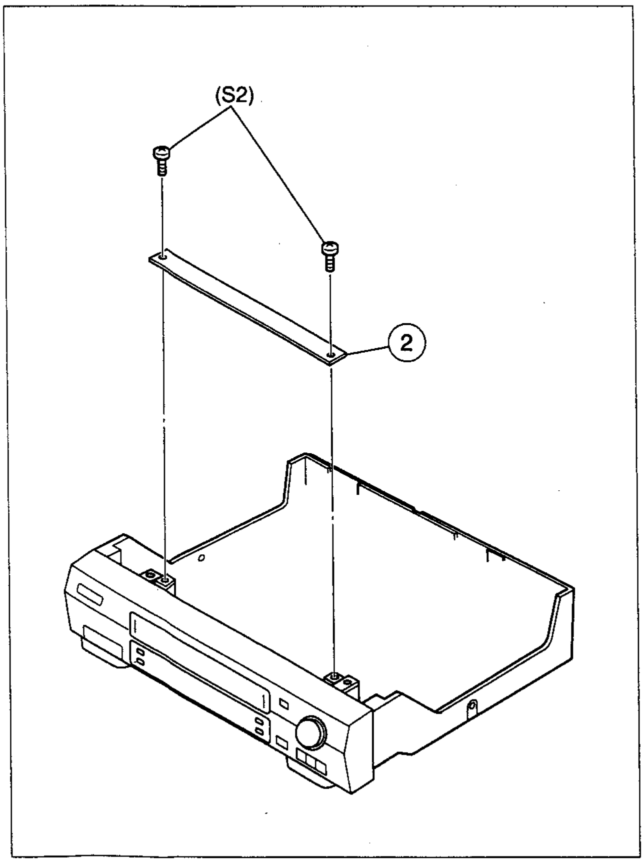


Fig. D2

NOTE: When installing the DRUM assembly, secure the screws (S4) in the order of ⓐ, ⓑ, ⓒ.

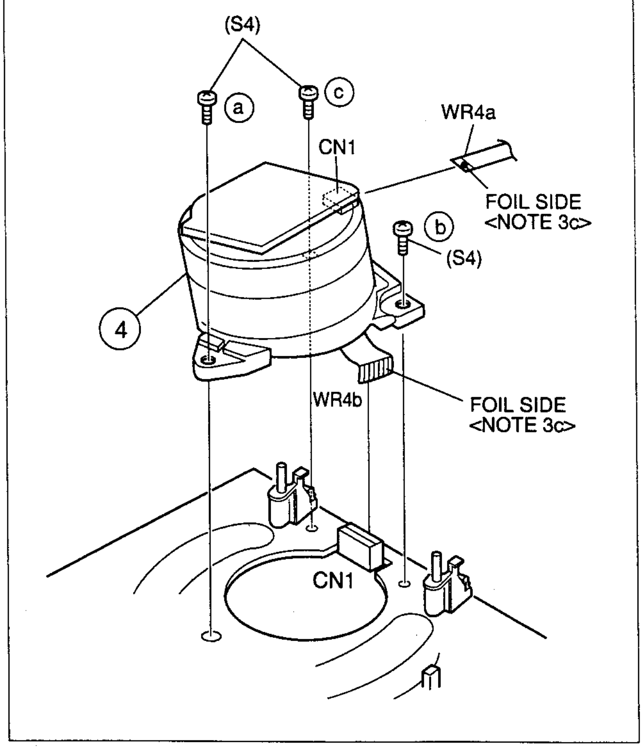

(S4)
a
c
WR4a
CN1
FOIL SIDE
<NOTE 3c>
b
(S4)
4
WR4b
FOIL SIDE
<NOTE 3c>
CN1

Fig. D4

NOTE: When installing the Mechanism assembly, secure the screws (S5a) in the order of ⓐ, ⓑ.

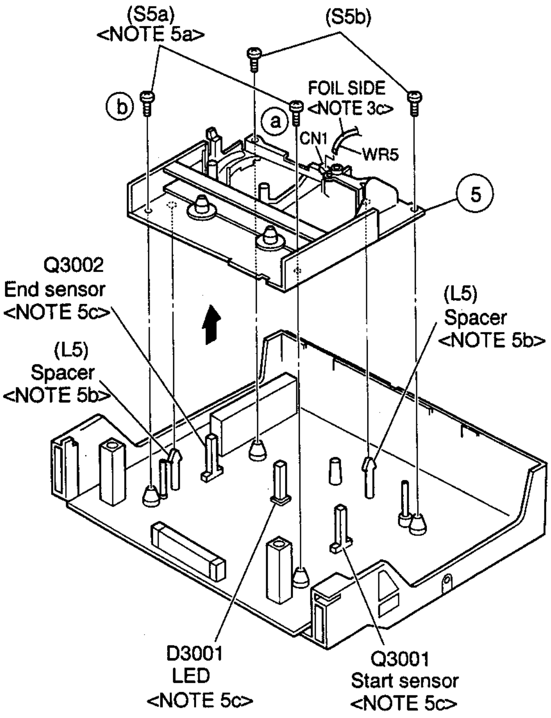

(S5a)
<NOTE 5a>
(S5b)
ⓑ
ⓐ
FOIL SIDE
<NOTE 3c>
CN1
WR5
5
Q3002
End sensor
<NOTE 5c>
(L5)
Spacer
<NOTE 5b>
(L5)
Spacer
<NOTE 5b>
D3001
LED
<NOTE 5c>
Q3001
Start sensor
<NOTE 5c>

Fig. D5

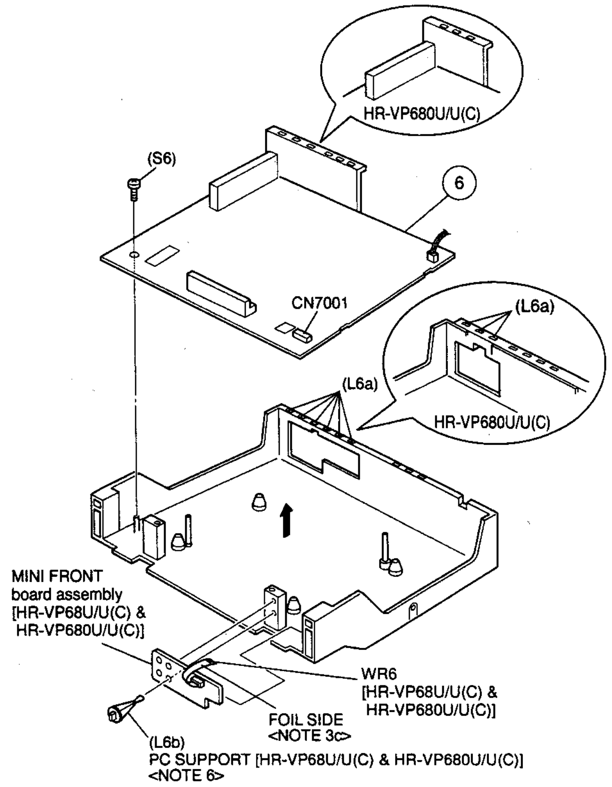

HR-VP680U/U(C)
(S6)
6
CN7001
(L6a)
(L6a)
HR-VP680U/U(C)
MINI FRONT
board assembly
[HR-VP68U/U(C) &
HR-VP680U/U(C)]
WR6
[HR-VP68U/U(C) &
HR-VP680U/U(C)]
FOIL SIDE
<NOTE 3c>
(L6b)
PC SUPPORT [HR-VP68U/U(C) & HR-VP680U/U(C)]
<NOTE 6>

Fig. D6

**Procedures for Lowering the Cassette holder assembly**

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two screws unscrewed when removing the Mechanism assembly.

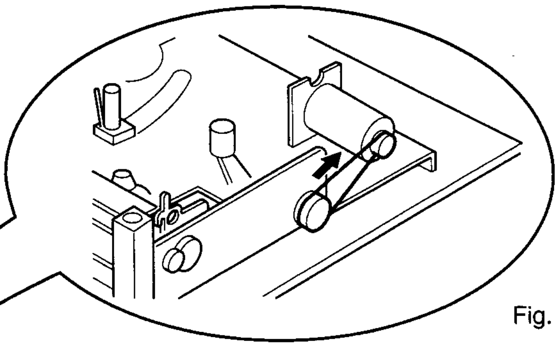


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As bothⒶandⒷlevers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

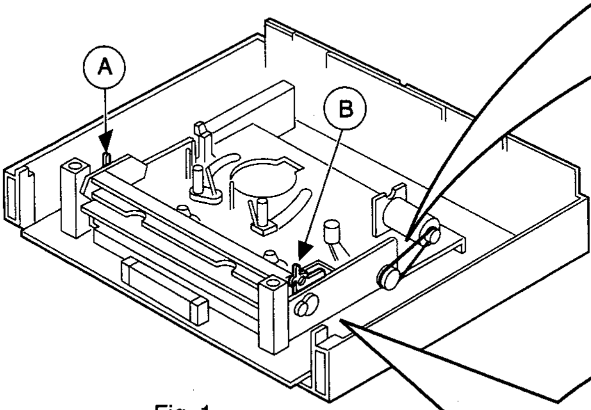


Fig. 1

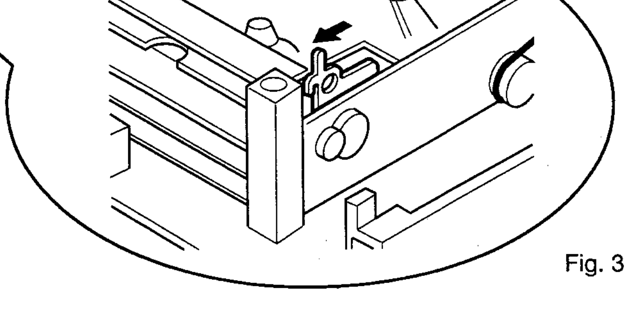


Fig. 3

## 1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Mechanism assembly, this unit is constructed so as to allow the Mechanism and Main board assemblies to be removed together from the Bottom chassis assembly.

### 1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly, and remove the Mini front board assembly for HR-VP68U/U(C) and HR-VP680U/U(C). (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Mechanism assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(3) Take out 2 screws Ⓐ, 2 screws Ⓑ and 1 screw Ⓒ as shown in Fig. 1-4-1.

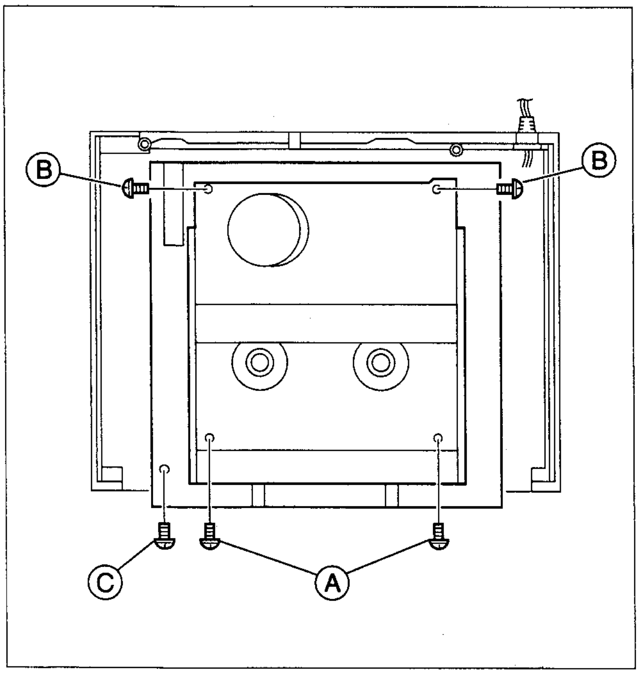


Fig. 1-4-1

(4) Remove the Main board and Mechanism assemblies together while holding the edge of the Main board assembly. At this stage be careful of the power cord and prongs of the jacks on the back side. (See Fig. 1-4-2.)

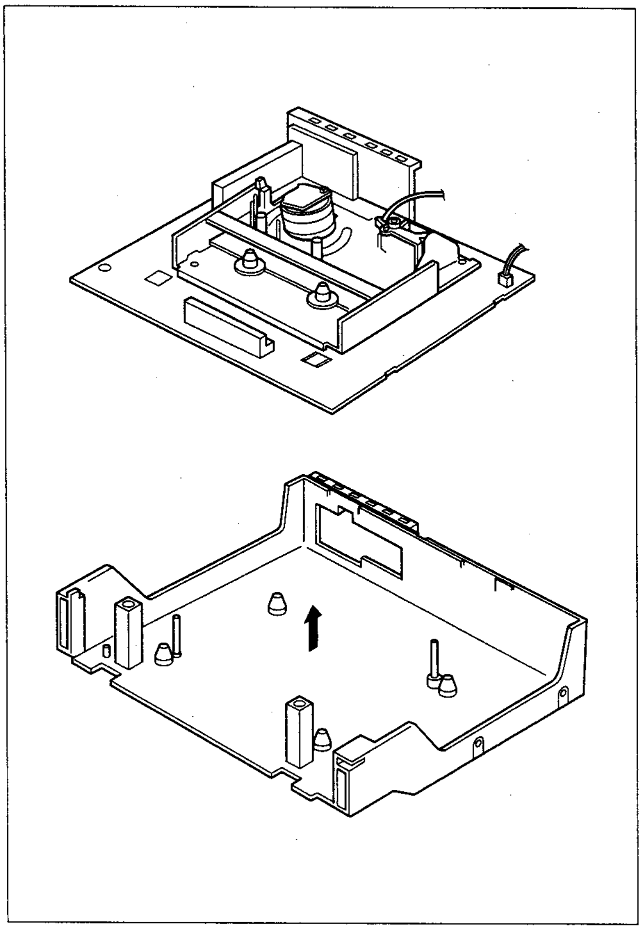


Fig. 1-4-2

(5) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

(6) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Mechanism assemblies together.

**NOTES:**
- *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and Mechanism assemblies.*

  *If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.*
- *When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position.*

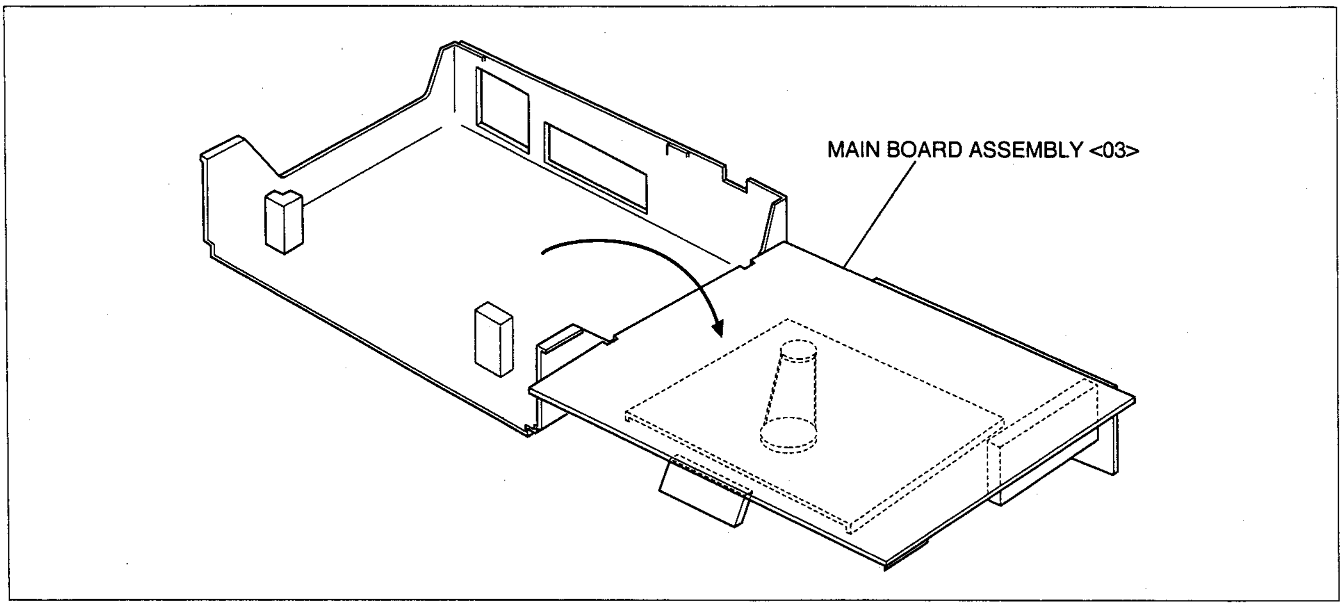

MAIN BOARD ASSEMBLY <03>

Fig. 1-4-3

### 1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

#### 1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Connect VCR to AC.
(4) Press the POWER button.
(5) With lock levers ⒶⒷ on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers ⒶⒷ, refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

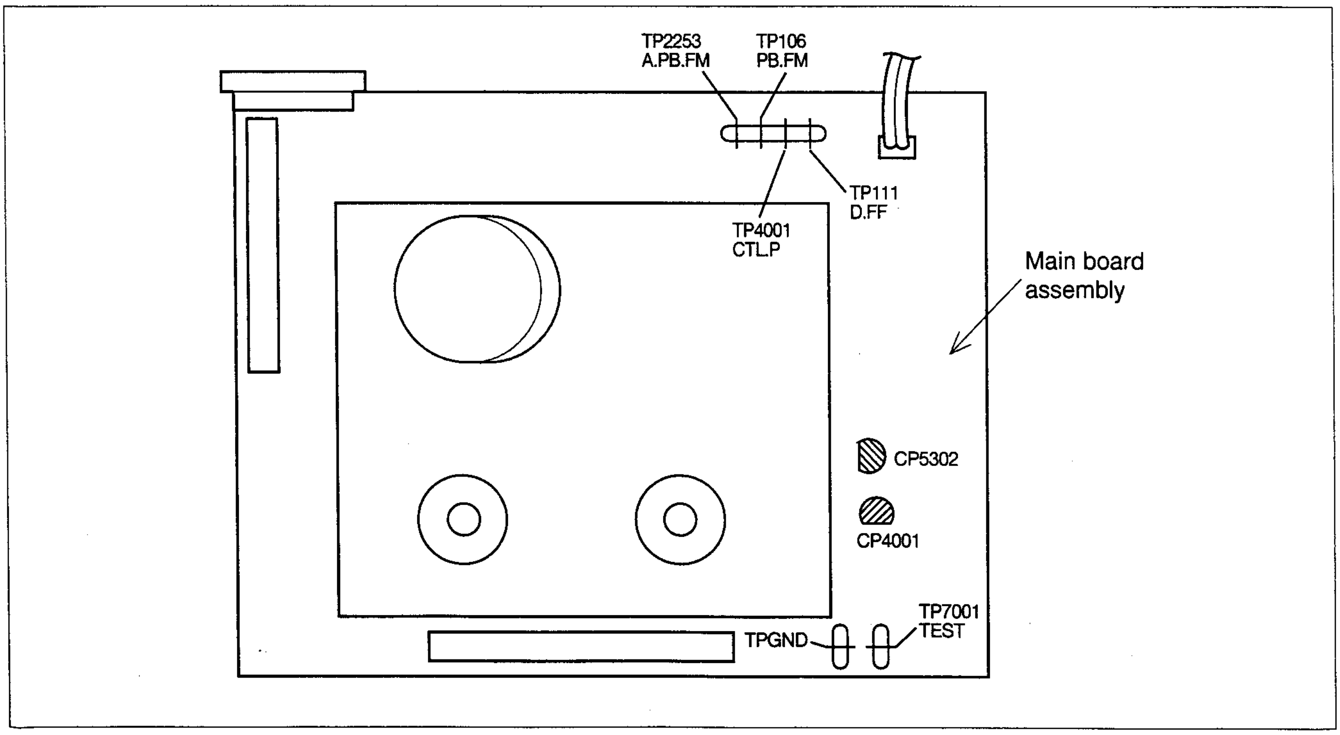

TP2253
A.PB.FM
TP106
PB.FM
TP111
D.FF
TP4001
CTL.P
Main board assembly
CP5302
CP4001
TP7001
TEST
TPGND

Fig. 1-5-1

## 1.6 EMERGENCY DISPLAY FUNCTION

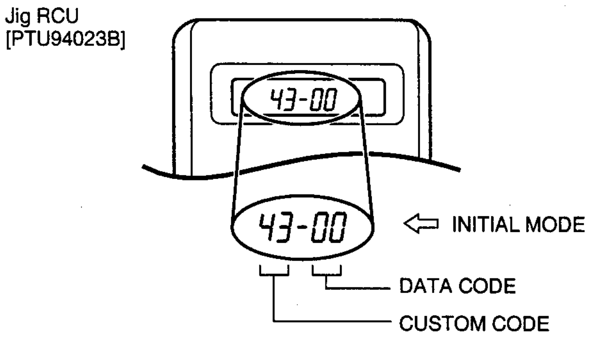
This unit has a function for storing the history of the past two emergencies (EMG) and displaying them on each FDP. With the status of the VCR and mechanism at the moment an emergency occurred can also be confirmed.

**FDP display switching**

→ FDP display 0 : 00 : 00 Normal display
↓
E : ** : ** Emergency content display (E:Latest:Previous)
↓
*1: *2 : 34 Emergency detail display ①
↓
*5: *6 : *7 Emergency detail display ②

**NOTES:** • *The emergency detail display ① ② show the information on the latest emergency. It becomes " - - : - - : - -" when there is no latest emergency record.*

• *When using the Jig RCU, set its custom code to match the custom code of the VCR.*



[Data transmitting method]
Depress the "📶" ( [3] ) button after the data code is set.

Fig. 1-6-1 Jig RCU

### 1.6.1 Displaying the emergency information

(1) Transmit the code "59" from the Jig RCU.
The FDP shows the emergency content in the form of "E:\*\*:**".

Example 1 E : 01 : 03
↑ 01 — Latest emergency
↑ 03 — Previous emergency

Example 2 E : - - : - - ← No emergency record

**NOTE:** • *For the emergency content, see "1.6.3 Emergency content description".*

(2) Transmit the code "59" from the Jig RCU again.
The FDP shows the emergency detail information ① in the form of "*1 : *2 : 34".

*1 : Deck operation mode at the moment of emergency
*2 : Mechanism mode at the moment of emergency
3– : Mechanism sensor information at the moment of emergency
–4 : Mechanism mode position at the moment of emergency

**NOTE:** • *For the emergency detail information ①, see "1.6.4 Emergency detail information ①".*

(3) Transmit the code "59" from the Jig RCU once again.
The FDP shows the emergency detail information ② in the form of "*5 : *6 : *7".

*5 : Type of the cassette tape in use ①.
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use ② (Winding area)

**NOTE:** • *For the emergency detail information ②, see "1.6.5 Emergency detail information ②".*

(4) Transmit the code "59" from the Jig RCU once again to reset the display.

### 1.6.2 Clearing the emergency history

(1) Display the emergency history.
(2) Transmit the code "36" from the Jig RCU.
(3) Reset the emergency display.

### 1.6.3 Emergency content description

**NOTE:** *Emergency contents "E08/E09" are for the model with Dynamic Drum (DD).*

| FDP | CONTENT | CAUSE |
|---|---|---|
| E01: Loading EMG | When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the loading direction, [E:01] is identified and the power is turned off. | ① The mechanism is locked in the middle of mode transition.<br>② The mechanism is locked at the loading end due to the encoder position reading error during mode transition.<br>③ Power is not supplied to the loading MDA. |
| E02: Unloading EMG | When the mechanism mode cannot be changed to another mode even when the loading motor has rotated for more than 4 seconds in the unloading direction, [E:02] is identified and the power is turned off. | ① The mechanism is locked in the middle of mode transition.<br>② The mechanism is locked at the unloading end due to the encoder position reading error during mode transition.<br>③ Power is not supplied to the loading MDA. |
| E03: Take Up Reel Pulse EMG | When the take-up reel pulse has not been generated for more than 4 seconds in the capstan rotating mode, [E:03] is identified, the pinch rollers are turned off and stopped, and the power is turned off. However, the reel EMG is not detected in STILL/SLOW modes. | ① The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because;<br>1) The idler gear is not meshed with the take-up reel gear;<br>2) The idler gear is meshed with the take-up reel gear, but incapable of winding due to too large mechanical load (abnormal tension);<br>3) The take-up reel sensor does not output the FG pulse.<br>② The supply reel pulse is not generated in the REV transport modes (REV SEARCH/REW, etc.) because;<br>1) The idler gear is not meshed with the supply reel gear.<br>2) The idler gear is meshed with the supply reel gear, but incapable of winding due to too large a mechanical load (abnormal tension);<br>3) The supply reel sensor does not output the FG pulse.<br>③ Power is not supplied to the reel sensors. |
| E04: Drum FG EMG | When the drum FG pulse has not been input for more than 3 seconds in the drum rotating mode, [E:04] is identified, the pinch rollers are turned off and stopped, and the power is turned off. | ① The drum could not start or the drum rotation has stopped due to too large a load on the tape, because;<br>1) The tape tension is abnormally high;<br>2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape.<br>② The drum FG pulse did not reach the System controller CPU because;<br>1) The signal circuit is disconnected in the middle;<br>2) The FG pulse generator (hall device) of the drum is faulty.<br>③ The drum control voltage (DRUM CTL V) is not supplied to the MDA.<br>④ Power is not supplied to the drum MDA. |
| E05: Cassette Eject EMG | When the eject operation does not complete in 3 seconds after the start, [E:05] is identified, the pinch rollers are turned off and stopped, and the power is turned off.<br>When the cassette insertion operation does not complete in 3 seconds after the start, the cassette is ejected. In addition, when the operation does not complete within 3 seconds after the start, [E:05] is also identified and the power is turned off immediately. | ① The cassette cannot be ejected due to a failure in the drive mechanism of the housing.<br>② When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque.<br>Housing load increasing factors: Temperature environment (low temperature, etc.), mechanism wear or failure.<br>③ The sensor/switch for detecting the end of ejection are not functioning normally.<br>④ The loading motor drive voltage is lower than specified or power is not supplied to the motor (MDA).<br>⑤ When the user attempted to eject a cassette, a foreign object (or perhaps the user's hand) was caught in the opening of the housing. |
| E06: Capstan FG EMG | When the capstan FG pulse has not been generated for more than 1 second in the capstan rotating mode, [E:06] is identified, the pinch rollers are turned off and stopped, and the power is turned off.However, the capstan EMG is not detected in STILL/SLOW/FF/REW modes. | ① The capstan could not start or the capstan rotation has stopped due to too large a load on the tape, because;<br>1) The tape tension is abnormally high (mechanical lock);<br>2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occurrence of tape entangling, etc.).<br>② The capstan FG pulse did not reach the System controller CPU because;<br>1) The signal circuit is disconnected in the middle;<br>2) The FG pulse generator (MR device) of the capstans is faulty.<br>③ The capstan control voltage (CAPSTAN CTL V) is not supplied to the MDA.<br>④ Power is not supplied to the capstan MDA. |
| E07: SW Power Short-Circuit EMG | When short-circuiting of the SW power supply with GND has lasted for 0.5 second or more, [E:07] is identified, all the motors are stopped and the power is turned off. | ① The SW 5 V power supply circuit is shorted with GND.<br>② The SW 12 V power supply circuit is shorted with GND. |
| E08: DD Initialized (Absolute Position Sensor) EMG | When DD tilting does not complete in 4 seconds, [E:08] is identified, the tilt motor is stopped and the power is turned off. | ① The absolute value sensor is defective. (The soldered parts have separated.)<br>② The pull-up resistor at the absolute sensor output is defective. (The soldered parts have separated.)<br>③ Contact failure or soldering failure of the pins of the connector (board-to-board) to the absolute value sensor.<br>④ The absolute value sensor data is not sent to the System Controller CPU. |
| E09: DD FG EMG | When the DD FG pulse is not generated within 2.5 seconds, [E:09] is identified, the tilt motor is stopped and the power is turned off. | ① The FG sensor is defective. (The soldered parts have separated.)<br>② The pull-up resistor at the FG sensor output is defective. (The soldered parts have separated.)<br>③ Contact failure or soldering failure of the pins of the connector (board-to-board) to the FG sensor.<br>④ The power to the sensor is not supplied. (Connection failure/soldering failure)<br>⑤ The FG pulse is not sent to the System Controller CPU.<br>⑥ The tilt motor is defective. (The soldered parts have separated.)<br>⑦ The drive power to the tilt motor is not supplied. (Connection failure/soldering failure)<br>⑧ The tilt motor drive MDA - IC is defective.<br>⑨ Auto-recovery of the DD tilting cannot take place due to overrun. |
| E0A: Supply Reel Pulse EMG | When the supply reel pulse has not been generated for more than 10 seconds in the capstan rotating mode, [E:0A] is identified and the cassette is ejected (but the power is not turned off). However, note that the reel EMG is not detected in the SLOW/STILL mode. | ① The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF, etc.) because;<br>1) PLAY/FWD or SEARCH/FF is started while the tape in the inserted cassette is cut in the middle;<br>2) A mechanical factor caused tape slack inside and outside the supply reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the FWD transport, so the pulse is not generated until then;<br>3) The FG pulse output from the supply reel sensor is absent.<br>② The take-up reel pulse is not generated in the REV transport mode (REV SEARCH/REW, etc.).<br>1) REV SEARCH/REW is started when the tape in the inserted cassette has been cut in the middle;<br>2) A mechanical factor caused tape slack inside and outside the take-up reel side of the cassette shell. In this case, the supply reel will not rotate until the tape slack is removed by the REV transport, so the pulse will not be generated until that time;<br>3) The FG pulse output from the take-up reel sensor is absent.<br>③ The power to a reel sensor is not supplied. |
| EU1: Head clog warning | Presupposing the presence of the control pulse output in the PLAY mode, when the value obtained by mixing the two V.FM output channels (without regard to the A.FM output) has remained below a certain threshold level for more than 10 seconds, [E:U1] is identified and recorded in the emergency history. During the period in which a head clog is detected, the FDP and OSD repeat the "3-second warning display" and "7-second noise picture display" alternately.<br>EMG code : "E:U1" / FDP : "U:01" / OSD : "Try cleaning tape."<br>The head clog warning is reset when the above-mentioned threshold has been exceeded for more than 2 seconds or the mode is changed to another mode than PLAY. | |

Table 1-6-1

### 1.6.4 Emergency detail information ①

The status (electrical operation mode) of the VCR and the status (mechanism operation mode/sensor information) of the mechanism in the latest emergency can be confirmed based on the figure in EMG detail information ①.

**[FDP display]**

*1 : *2 : 34

*1 : Deck operation mode at the moment of emergency
*2 : Mechanism mode at the moment of emergency
3- : Mechanism sensor information at the moment of emergency
-4 : Mechanism mode position at the moment of emergency

***1 : Deck Operation Mode**

| Display | Deck Operation Mode |
|---|---|
| 00 | Mechanism being initialized |
| 01 | STOP with pinch roller pressure off (or tape present with P.OFF) |
| 02 | STOP with pinch roller pressure on |
| 03 | POWER OFF as a result of EMG |
| 04 | PLAY |
| 0C | REC |
| 10 | Cassette ejected |
| 20 | FF |
| 21 | Tape fully loaded, START sensor ON, short FF |
| 22 | Cassette identification FWD SEARCH before transition to FF (SP x7-speed) |
| 24 | FWD SEARCH (variable speed) including x2-speed |
| 2C | INSERT REC |
| 40 | REW |
| 42 | Cassette identification REV SEARCH before transition to REW (SP x7-speed) |
| 44 | REV SEARCH (variable speed) |
| 4C | AUDIO DUB |
| 6C | INSERT REC (VIDEO + AUDIO) |
| 84 | FWD STILL/SLOW |
| 85 | REV STILL/SLOW |
| 8C | REC PAUSE |
| 8D | Back spacing |
| 8E | Forward spacing (FWD transport mode with BEST function) |
| AC | INSERT REC PAUSE |
| AD | INSERT REC Back spacing |
| CC | AUDIO DUB PAUSE |
| CD | AUDIO DUB Back spacing |
| EC | INSERT REC (VIDEO + AUDIO) PAUSE |
| ED | INSERT REC (VIDEO + AUDIO) Back spacing |

***2 : Mechanism Operation Mode**

| Display | Mechanism Operation Mode |
|---|---|
| 00 | Command standby (Status without executing command) |
| 02 | POWER OFF by EMG occurrence |
| 04 | Moving to the adjacent position in the LOAD direction |
| 06 | Moving to the adjacent position in the UNLOAD direction |
| 08 | Cassette ejection being executed |
| 0A | Cassette insertion being executed |
| 0C | Tape being loaded |
| 0E | Tape being unloaded |
| 10 | Mode transition to STOP with pinch roller compression ON |
| 12 | Mode transition to STOP with pinch roller compression OFF |
| 14 | Mode transition to STOP with pinch roller compression OFF as a result of POWER OFF |
| 16 | Mode transition to STOP with pinch roller compression ON as a result of POWER ON |
| 18 | Mode transition to PLAY |
| 1A | Mode transition to FWD SEARCH |
| 1C | Mode transition to REC |
| 1E | Mode transition to FWD STILL/SLOW |
| 20 | Mode transition to REV STILL/SLOW |
| 22 | Mode transition to REV SEARCH |
| 24 | Mode transition from FF/REW to STOP |
| 26 | Mode transition to FF |
| 28 | Mode transition to REW |
| 2A | 4 sec. of REV as a result of END sensor going ON during loading |
| 2C | Short FF/REV as a result of tape sensor going ON during unloading |
| 2E | Mechanism position being corrected due to overrun |
| 80 | Mechanism in initial position (Dummy command) |

**3- : Mechanism Sensor Information**

| Display | Mechanism Sensor Information | | | |
|---|---|---|---|---|
| | S-VHS SW | REC SAFETY SW | START SENSOR | END SENSOR |
| 0– | VHS | Tab broken | ON | ON |
| 1– | VHS | Tab broken | ON | OFF |
| 2– | VHS | Tab broken | OFF | ON |
| 3– | VHS | Tab broken | OFF | OFF |
| 4– | VHS | Tab present | ON | ON |
| 5– | VHS | Tab present | ON | OFF |
| 6– | VHS | Tab present | OFF | ON |
| 7– | VHS | Tab present | OFF | OFF |
| 8– | S-VHS | Tab broken | ON | ON |
| 9– | S-VHS | Tab broken | ON | OFF |
| A– | S-VHS | Tab broken | OFF | ON |
| B– | S-VHS | Tab broken | OFF | OFF |
| C– | S-VHS | Tab present | ON | ON |
| D– | S-VHS | Tab present | ON | OFF |
| E– | S-VHS | Tab present | OFF | ON |
| F– | S-VHS | Tab present | OFF | OFF |

**-4 : Mechanism Mode Position**

| Display | Mechanism Mode Position |
|---|---|
| -0 | Initial value |
| -1 | EJECT position |
| -2 | Housing operating |
| -3 | U/L STOP position |
| -4 | Tape being (un)loaded (Below the level of the pole base drum) |
| -5 | Tape being (un)loaded (Above the level of the pole base drum) |
| -6 | Pole base compressed position |
| -7 | FF/REW position |
| -8 | Between FF/REW and STOP with pinch roller compression ON |
| -9 | STOP with pinch roller compression OFF |
| -A | Between STOP with pinch roller compression OFF and REV |
| -B | REV (REV STILL/SLOW) position |
| -C | Between REV and FWD |
| -D | FWD (FWD STILL/SLOW) position |
| -E | Between FWD and PLAY |
| -F | PLAY position |

### 1.6.5 Emergency detail information ②

The type of the cassette tape and the cassette tape winding position can be confirmed based on the figure in EMG detail information ②.

**[FDP display]**

*5 : *6 : *7

*5 : Type of the cassette tape in use ①
*6 : Winding position of the cassette tape in use
*7 : Type of the cassette tape in use ② (Winding area)

**NOTE:** • *EMG detail information ② is the reference information stored using the remaining tape detection function of the cassette tape. As a result, it may not identify cassette correctly when a special cassette tape is used or when the tape has variable thickness.*

*5 : **Cassette tape type ①**

| Display | Cassette Tape Type ① |
|---|---|
| 00 | Cassette type not identified |
| 16 | Large reel/small reel (T-0 to T-15/T-130 to T-210) not classified |
| 82 | Small reel, thick tape (T-120) identified /thin tape (T-140) identified |
| 84 | Large reel (T-0 to T-60) identified |
| 92 | Small reel, thick tape (T-130) identified /thin tape (T-160 to T-210) identified |
| 93 | Small reel, thick tape/C cassette (T-0 to T-100/C cassette) not classified |
| C3 | Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified |
| D3 | Small reel, thick tape/C cassette (T-0 to T-100/C cassette) being classified |
| E1 | C cassette, thick tape (TC-0 to TC-20) identified |
| E2 | Small reel, thick tape (T-0 to T-100) identified |
| E9 | C cassette, thin tape (TC-30 to TC-40) identified |
| F1 | C cassette, thick tape/thin tape (TC-10 to TC-40) not classified |

**NOTES:** • *Cassette tape type ① is identified a few times during mode transition and the identification count is variable depending on the cassette tape type. If an EMG occurs in the middle of identification, the cassette tape type may not be able to be identified.*

• *If other value than those listed in the above table is displayed, the cassette tape type is not identified.*

*6 : **Cassette tape winding position**

The cassette tape winding position at the moment of EMG is displayed by dividing the entire tape (from the beginning to the end) in 22 sections using a hex number from "00" to "15".

"00" : End of winding
"15" : Beginning of winding
"FF" : Tape position not identified

*7 : **Cassette tape type ② (Winding area)**

| Display | Cassette Tape Type ② | |
|---|---|---|
| 00 | Cassette type not identified | |
| 07 | Small reel, thick tape | T-5 |
| 08 - 0E | C cassette, thick tape | TC-10 |
| 09 - 15 | C cassette, thick tape | TC-20P |
| 0A - 0B | Small reel, thick tape | T-20 |
| 0A - 16 | C cassette, thin tape | TC-30 |
| 0A - 16 | C cassette, thin tape | TC-40 |
| 0D - 0F | Small reel, thick tape | T-40 |
| 11 - 14 | Small reel, thick tape | T-60 |
| 15 - 18 | Small reel, thick tape | T-80/DF-160 |
| 17 - 1A | Small reel, thick tape | T-80/DF-180 |
| 19 - 1D | Small reel, thick tape | T-100 |
| 1D - 21 | Small reel, thick tape | T-120/DF-240 |
| 1E - 1F | Small reel, thin tape | T-140 |
| 1F - 23 | Small reel, thick tape | T-130 |
| 21 - 23 | Small reel, thin tape | T-160 |
| 21 - 23 | Small reel, thin tape | T-168 |
| 22 - 24 | Small reel, thick tape | DF-300 |
| 22 - 24 | Small reel, thin tape | T-180/DF-380 |
| 22 - 24 | Small reel, thin tape | T-210/DF-420 |
| 22 - 23 | Large reel | T-5 |
| 23 - 24 | Large reel | T-10 |
| 25 - 26 | Large reel | T-20 |
| 27 - 29 | Large reel | T-30 |
| 29 - 2B | Large reel | T-40 |
| 2D - 2F | Large reel | T-60 |

**NOTE:** • *The values of cassette tape type ② in the above table are typical values with representative cassette tapes.*

## 1.7 SYSCON CIRCUIT

### 1.7.1 Syscon CPU pin function (IC3001)

| PIN NO. | LABEL | IN/OUT | FUNCTION |
|---|---|---|---|
| 1 | SP_FG | IN | DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN |
| 2 | TU_FG | IN | DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN |
| 3 | PAUSE/COMPU_IN | IN | REMOTE PAUSE INPUT/AUDIO/VIDEO COMPULINK INPUT |
| 4 | EV_MASK/BS_P.CTL | - | NC |
| 5 | RC | IN | REMOTE CONTROL DATA INPUT |
| 6 | NC | - | NC |
| 7 | TU_CLK | OUT | CLOCK FOR DATA TRANSFER TO THE TUNER UNIT |
| 8 | TU_DATA | OUT | TUNING DATA |
| 9 | TU_CE | OUT | CHIP ENABLE OF THE TUNER UNIT |
| 10 | LMC1 | OUT | LOADING MOTOR DRIVE (1) |
| 11 | LMC2 | OUT | LOADING MOTOR DRIVE (2) |
| 12 | EP(H) | - | NC |
| 13 | RMO/R-Y_REV. | - | NC |
| 14 | BIL_SEL/A.EVENT_DET | - | NC |
| 15 | CONV_CTL(H) | OUT | R/F CONVERTER ON/OFF (ON:H, OFF:L) |
| 16 | CTL_GAIN | OUT | CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING |
| 17 | I2C_DATA | IN/OUT | I/O DATA FOR THE MEMORY IC |
| 18 | I2C_CLK/TEST | OUT | SERIAL DATA TRANSFER CLOCK FOR THE MEMORY IC/MECHANISM TEST SIGNAL |
| 19 | SP_SHORT(H) | - | NC |
| 20 | EP_SHORT(H) | - | NC |
| 21 | SB_GAIN | OUT | VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE |
| 22 | CAP_REV(L) | OUT | CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L) |
| 23 | D.FF | OUT | ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC |
| 24 | V.PULSE | OUT | V.PULSE ADDITION TIMING CONTROL |
| 25 | RESET | - | RESET TERMINAL (RESET ON:L) |
| 26 | A.FF | OUT | AUDIO FF OUTPUT |
| 27 | N.REC_ST(H) | OUT | NORMAL AUDIO SOUND RECORDING START |
| 28 | CHARA | - | NC |
| 29 | AGC_CTL/SLOW_PULSE | OUT | DETECTION SIGNAL FOR AGC |
| 30 | H.REC_ST(H) | OUT | HIFI AUDIO SOUND RECORDING START |
| 31 | TU_MUTE(H) | OUT | TUNER AUDIO MUTE CONTROL (MUTE:H) [HR-VP780U/U(C)] |
| 32 | NC | - | NC |
| 33 | CAP_CTL_V | OUT | CAPSTAN MOTOR CONTROL |
| 34 | DRUM_CTL_V | OUT | DRUM MOTOR CONTROL |
| 35 | A.MUTE(H) | OUT | AUDIO MUTE CONTROL (MUTE:H) |
| 36 | VDD | - | SYSTEM POWER |
| 37 | X OUT | - | MAIN SYSTEM CLOCK (14.32MHz) |
| 38 | X IN | - | MAIN SYSTEM CLOCK (14.32MHz) |
| 39 | VSS | - | GND |
| 40 | XC IN | - | TIMER CLOCK (32.768kHz) |
| 41 | XC OUT | - | TIMER CLOCK (32.768kHz) |
| 42 | CLK SEL | IN | SELECT FOR BACKUP METHOD (LITHIUM OR E.CAP):H |
| 43 | P.MUTE(L) | - | NC |
| 44 | V_UP(H) | - | NC |
| 45 | SYNC_DET | - | NC |
| 46 | P.CTL(H) | - | NC |
| 47 | VIDEO_OUT | OUT | COMPOSITE VIDEO SIGNAL OUTPUT |
| 48 | VSS2 | - | GND |
| 49 | CVIN | IN | COMPOSITE VIDEO SIGNAL INPUT |
| 50 | SYN_IN | IN | COMPOSITE SYNCHRONIZING SIGNAL FOR SERVO, VERTICAL SYNCHRONIZING SIGNAL FOR OSD |

| PIN NO. | LABEL | IN/OUT | FUNCTION |
|---|---|---|---|
| 51 | VDD2 | - | SYSTEM POWER |
| 52 | AFCC | IN | FILTER INPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER |
| 53 | AFCLPF | OUT | FILTER INPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER |
| 54 | FSCI/BIT_IN(H) | - | NC |
| 55 | FSCLPF/ANT.CTL | - | NC |
| 56 | I2C_DATA_A/V | IN/OUT | I/O DATA FOR MEMORY IC |
| 57 | I2C_CLK_A/V | OUT | SERIAL DATA TRANSFER CLOCK FOR MEMORY IC |
| 58 | NC | - | NC |
| 59 | NC | - | NC |
| 60 | LMC3 | OUT | LOADING MOTOR DRIVE(3) |
| 61 | LSA | IN | MECHANISM MODE DETECT(A) |
| 62 | LSB | IN | MECHANISM MODE DETECT(B) |
| 63 | LSC | IN | MECHANISM MODE DETECT(C) |
| 64 | NC | - | NC |
| 65 | D.FG_IN | IN | DRUM FG PULSE INPUT |
| 66 | D.PG_IN | IN | DRUM PICKUP PULSE INPUT(SWITCHING PULSE) |
| 67 | C.FG_AMP_OUT | OUT | SET-UP OUTPUT FOR CAPSTAN FG AMPLIFICATION FACTOR |
| 68 | C.FG_IN | IN | CAPSTAN FG PULSE INPUT |
| 69 | AMP_VREF_OUT | OUT | AMP CIRCUIT REFERENCE VOLTAGE OUTPUT |
| 70 | AMP_VREF_IN | - | NC |
| 71 | AVSS | - | GND |
| 72 | AMP_C | IN | CAPACITOR CONNECT TERMINAL FOR CTL AMP CIRCUIT |
| 73 | AVCC | - | SYSTEM POWER |
| 74 | CTL_+ | IN/OUT | CTL(+) SIGNAL |
| 75 | CTL_- | IN/OUT | CTL(-) SIGNAL |
| 76 | CTL_AMP_OUT | OUT | CTL PULSE OUTPUT |
| 77 | LOCK(L) | IN | TUNING PLL LOCK DETECT:L |
| 78 | BS_ANT/KILLER_OUT | - | NC |
| 79 | START_SENSOR | IN | START SENSOR |
| 80 | FULLE.ON(H) | - | NC |
| 81 | REC_SAFETY | IN | REC SAFETY SWITCH DETECT (SW ON:L) |
| 82 | COMPU_OUT | OUT | A/V COMPULINK OUTPUT |
| 83 | VIDEO_ENV | IN | AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL |
| 84 | A_ENV/ND(L) | IN | AUDIO PB FM ENV.INPUT/NON HiFi MODE: L |
| 85 | END_SENSOR | IN | END SENSOR |
| 86 | AFC/JUST_CLK | IN | TUNING CHECK/NC |
| 87 | SW2/LED | - | NC |
| 88 | IND(L) | - | NC |
| 89 | IND(R) | - | NC |
| 90 | POWER_DET | IN | DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY |
| 91 | P.SAVE(L) | - | NC |
| 92 | N.REC(H) | OUT | NORMAL AUDIO REC MODE CONTROL (REC:H) |
| 93 | NC | - | NC |
| 94 | PROTECT | IN | DETECTION SIGNAL FOR SW. POWER SUPPLY |
| 95 | STB | OUT | STROBE (FOR FDP DRIVER) |
| 96 | S.CLK | OUT | SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC |
| 97 | S_DATA_FRSYS | OUT | SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC |
| 98 | S_DATA_TOSYS | IN | SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO THE FDP DRIVER |
| 99 | JSA | IN | INPUT FOR THE JOG SHUTTLE [HR-VP780U/U(C)] |
| 100 | JSB | IN | INPUT FOR THE JOG SHUTTLE [HR-VP780U/U(C)] |

# SECTION 2
# MECHANISM ADJUSTMENT

## 2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

### 2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of the cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

### 2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE.)

### 2.1.3 Manually Removing the Cassette Tape

#### 1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(2) Unload the cassette by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1.)
(3) Bring the pole base assembly (supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top guide toward the drum while holding down the lug Ⓐ of the bracket retaining the top guide. Likewise hold part Ⓑ down and remove the top guide. Section Ⓒ of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-2.)
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

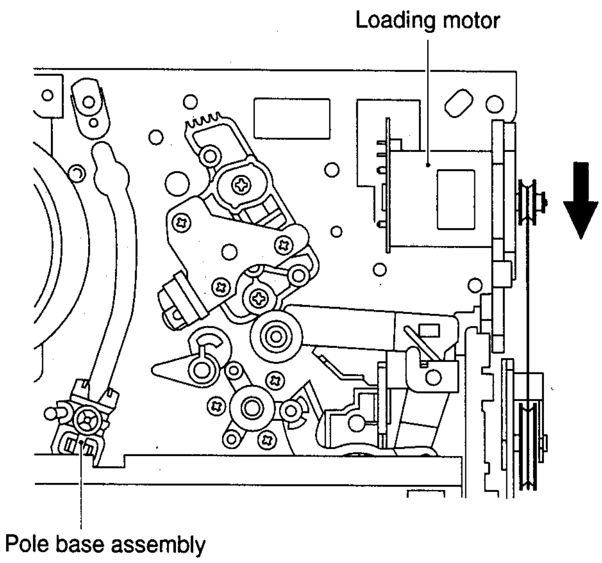


Fig. 2-1-1

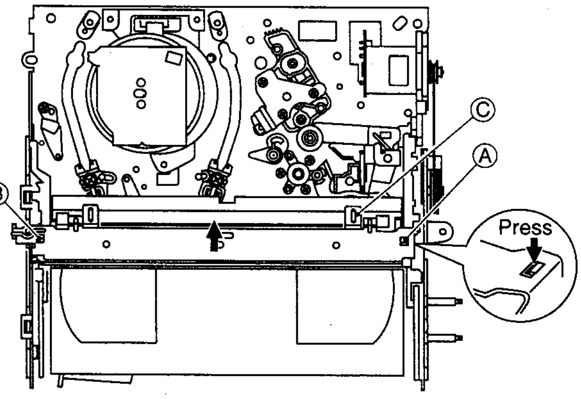


Fig. 2-1-2

## 2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3.)

(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-4.)

(4) In the same way as in the electrical failure instructions in 2.1.3 (4), remove the top guide.

(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.

(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

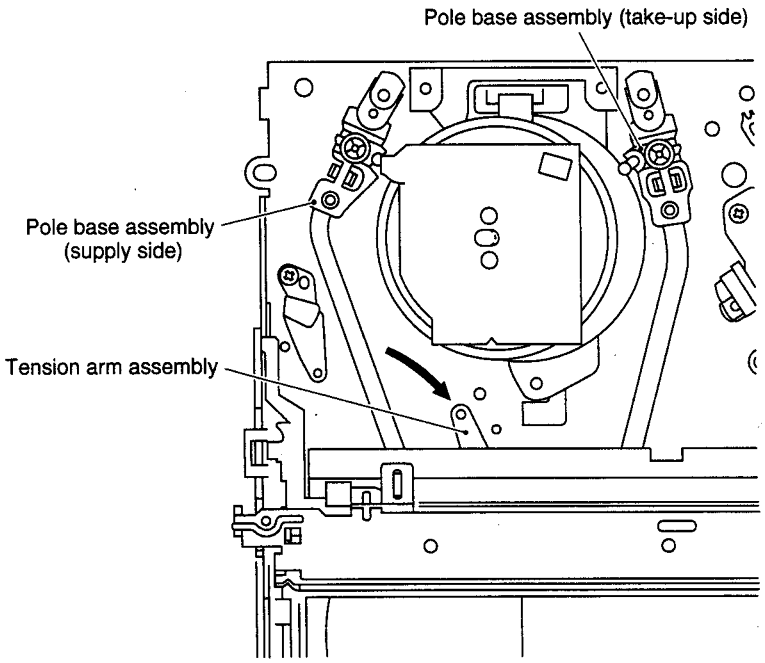

Pole base assembly (take-up side)
Pole base assembly (supply side)
Tension arm assembly

Fig. 2-1-3

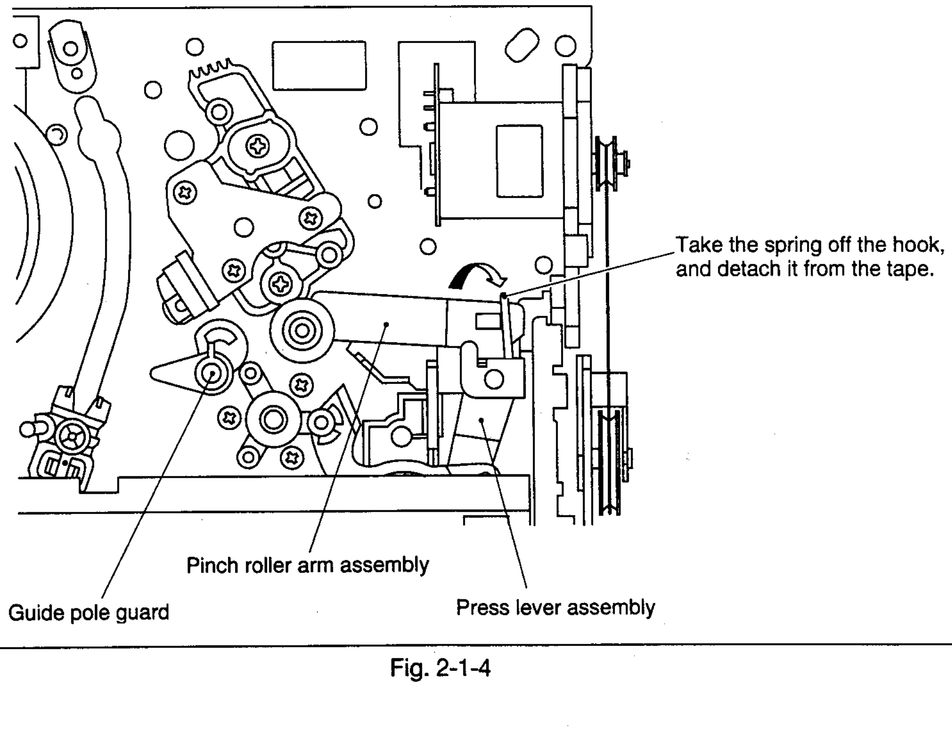

Take the spring off the hook, and detach it from the tape.
Pinch roller arm assembly
Guide pole guard
Press lever assembly

Fig. 2-1-4

### 2.1.4 Jigs and Tools Required for Adjustment

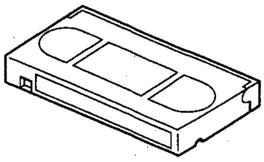
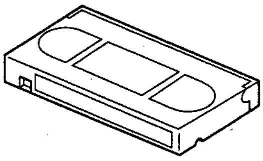
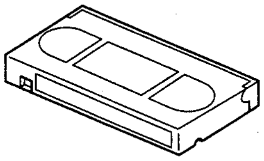
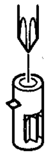
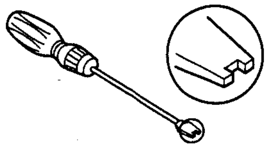
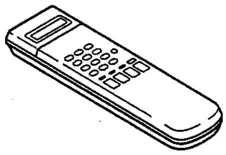
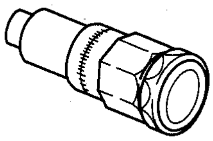
| Alignment tape (SP)<br>MHP | Alignment tape (EP)<br>MHP-L | Back tension cassette gauge<br>PUJ48076-2 | A/C head positioning tool<br>PTU94010 |
|---|---|---|---|
|  |  |  |  |
| Roller driver<br>PTU94002 | Jig RCU<br>PTU94023B | Torque gauge<br>PUJ48075-2 | |
|  |  |  | |

Table 2-1-1 Jigs and tools required for adjustment

### 2.1.5 Maintenance and Inspection

### 1. Location of major mechanical parts

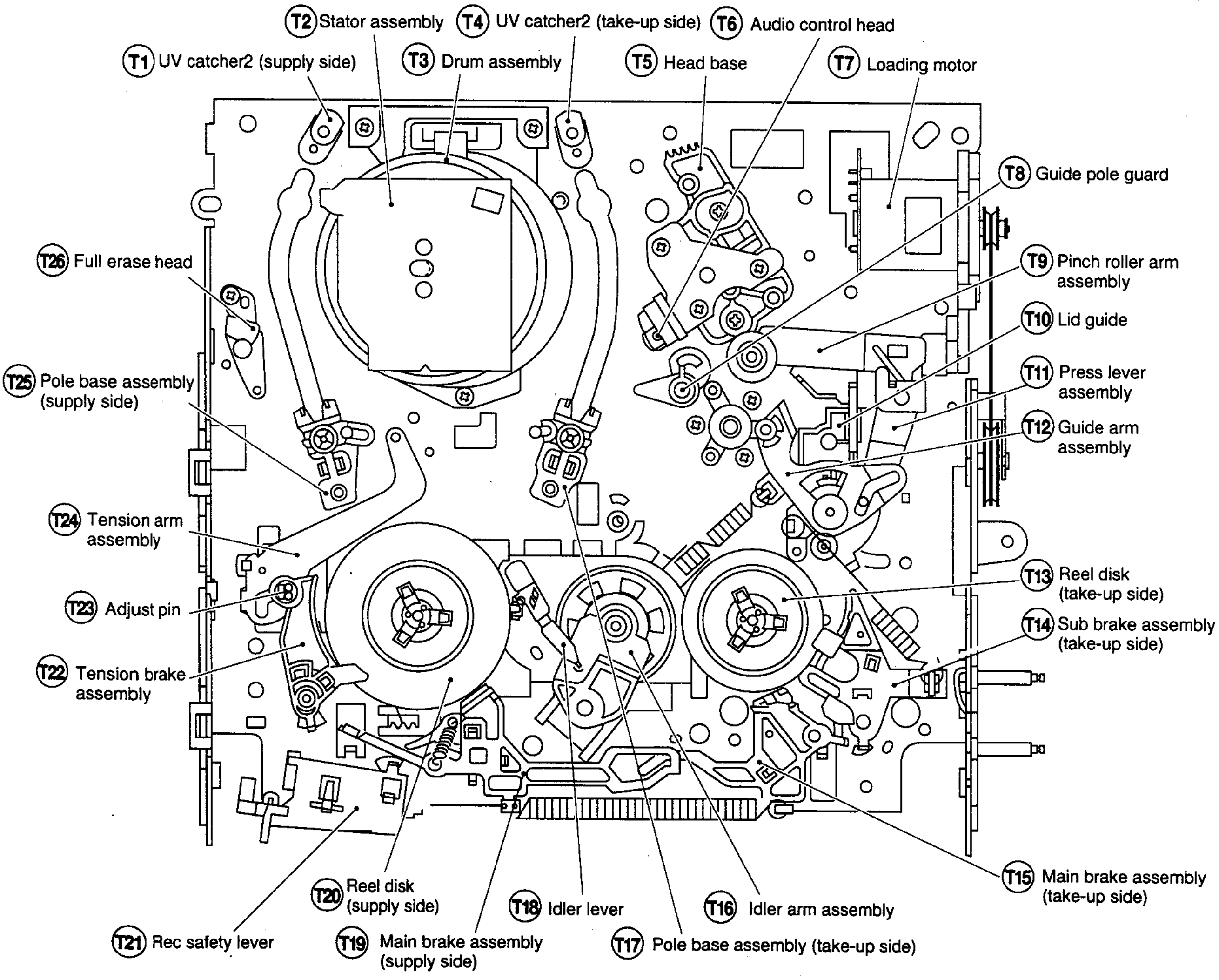

T1 UV catcher2 (supply side)
T2 Stator assembly
T3 Drum assembly
T4 UV catcher2 (take-up side)
T5 Head base
T6 Audio control head
T7 Loading motor
T8 Guide pole guard
T9 Pinch roller arm assembly
T10 Lid guide
T11 Press lever assembly
T12 Guide arm assembly
T13 Reel disk (take-up side)
T14 Sub brake assembly (take-up side)
T15 Main brake assembly (take-up side)
T16 Idler arm assembly
T17 Pole base assembly (take-up side)
T18 Idler lever
T19 Main brake assembly (supply side)
T20 Reel disk (supply side)
T21 Rec safety lever
T22 Tension brake assembly
T23 Adjust pin
T24 Tension arm assembly
T25 Pole base assembly (supply side)
T26 Full erase head

Fig. 2-1-5 Mechanism assembly top side

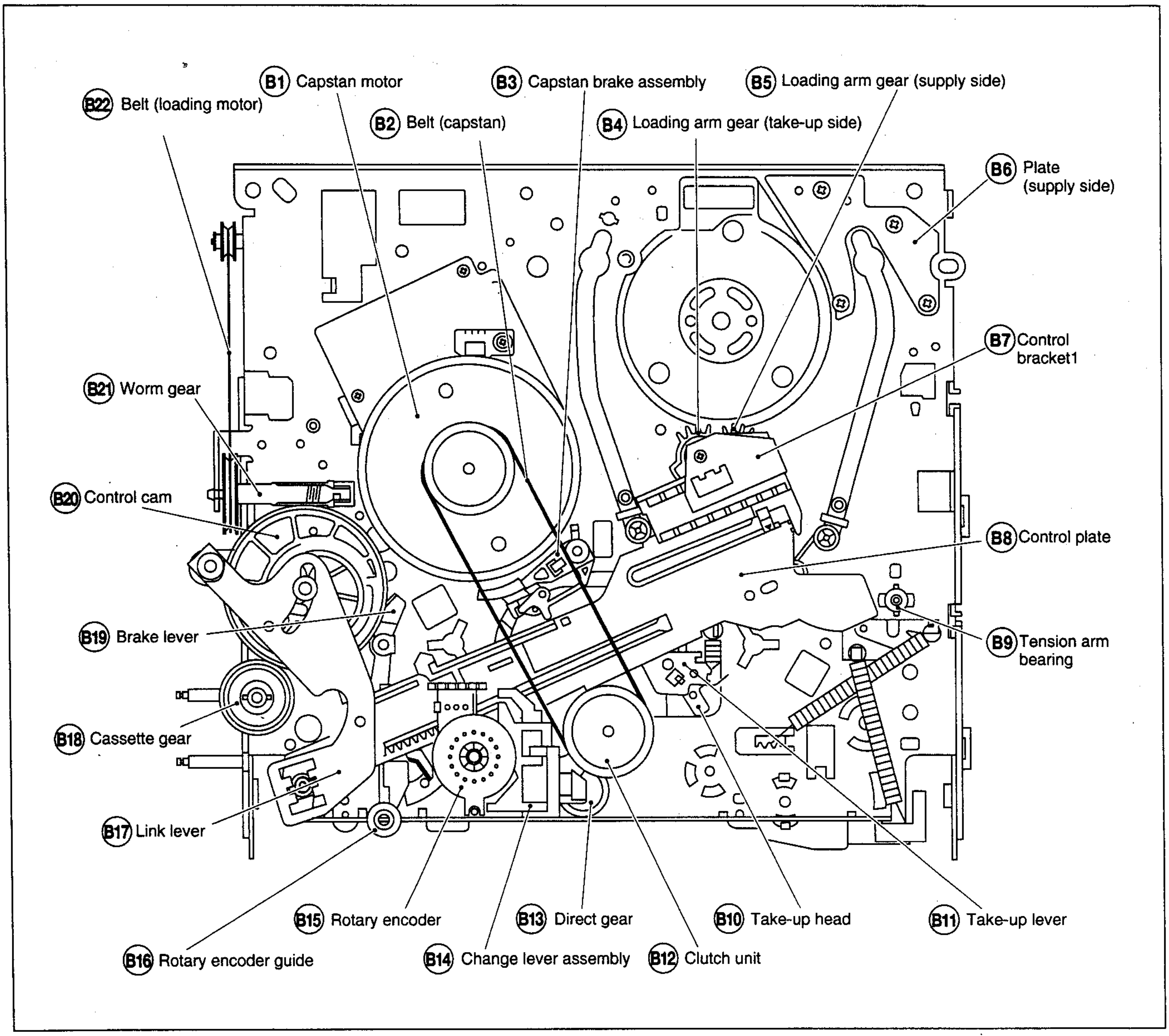

B1 Capstan motor
B3 Capstan brake assembly
B5 Loading arm gear (supply side)
B22 Belt (loading motor)
B2 Belt (capstan)
B4 Loading arm gear (take-up side)
B6 Plate (supply side)
B7 Control bracket1
B21 Worm gear
B20 Control cam
B8 Control plate
B19 Brake lever
B9 Tension arm bearing
B18 Cassette gear
B17 Link lever
B15 Rotary encoder
B13 Direct gear
B10 Take-up head
B11 Take-up lever
B16 Rotary encoder guide
B14 Change lever assembly
B12 Clutch unit

Fig. 2-1-6 Mechanism assembly bottom side

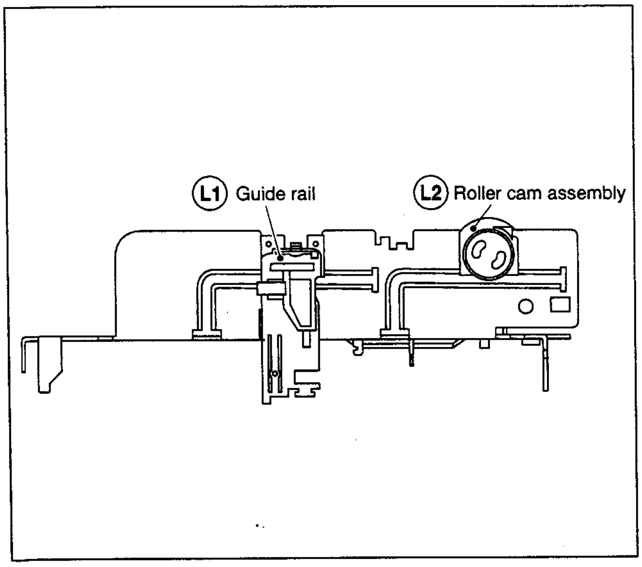

L1 Guide rail
L2 Roller cam assembly

Fig. 2-1-7 Mechanism assembly left side

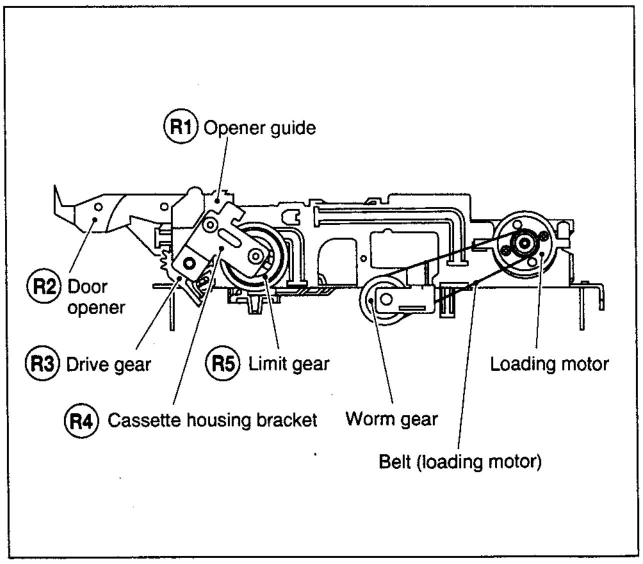

R1 Opener guide
R2 Door opener
R3 Drive gear
R5 Limit gear
Loading motor
R4 Cassette housing bracket
Worm gear
Belt (loading motor)

Fig. 2-1-8 Mechanism assembly right side

**Note:** *This table shows the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.*
*The circled numbers (symbols and numbers) preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.*

| | Symbols and numbers | | | (L1) | (L2) | (R4) | (R1) | – | – | (R3) | – | (T9) | (T12) | (T11) | (T1)(T4) | (B15) | (B12) | (B14) | (B13) | (B17) | (B21) | (B7) | (B8) | (B5) | (B4) | (B11) | (T14) | (T15) | (T13) | (T22) | (T24) | (T18) | (B19) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Symbols and numbers | Removal parts / (Reference items) Replacement parts | Front (T)/Back (B) of mechanism | Number of removal steps | Guide rail | Roller cam assembly | Cassette housing bracket | Opener guide | Relay gear | Cassette holder assembly | Drive gear | Drive arm | Pinch roller arm assembly | Guide arm assembly | Press lever assembly | UV catcher2 | Rotary encoder | Clutch unit | Change lever assembly | Direct gear | Link lever | Worm gear | Control bracket1 | Control plate | Loading arm gear (supply side) | Loading arm gear (take-up side) | Take-up lever | Sub brake assembly (take-up side) | Main brake assembly (take-up side) | Reel disk (take-up side) | Tension brake assembly | Tension arm assembly | Idler lever | Brake lever |
| (L1) | 2.2.3 Guide rail | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (L2) | 2.2.3 Roller cam assembly | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (R4) | 2.2.3 Cassette housing bracket | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (R1) | 2.2.3 Opener guide | T | 2 | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (R2) | 2.2.3 Door opener | T | 3 | | | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| – | 2.2.3 Relay gear | T | 3 | | | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (R5) | 2.2.3 Limit gear | T | 3 | | | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| – | 2.2.3 Cassette holder assembly | T | 6 | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| (R3) | 2.2.3 Drive gear | T | 4 | | | 1 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| – | 2.2.3 Drive arm | T | 8 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | | | | | | | | | | | | | | | | |
| (T9) | 2.2.4 Pinch roller arm assembly | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T12) | 2.2.5 Guide arm assembly | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T11) | 2.2.5 Press lever assembly | T | 3 | | | | | | | | | 1 | 2 | | | | | | | | | | | | | | | | | | | | |
| (T6) | 2.2.6 Audio control head | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T7) | 2.2.7 Loading motor | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (B1) | 2.2.8 Capstan motor | T/B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T1)(T4) | 2.2.9 UV catcher2 | T | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T17) | 2.2.9 Pole base assembly (take-up side) | T/B | 2 | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| (T25) | 2.2.9 Pole base assembly (supply side) | T/B | 2 | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| (B15) | 2.2.10 Rotary encoder | B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (B12) | 2.2.11 Clutch unit | B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (B14) | 2.2.12 Change lever assembly | B | 3 | | | | | | | | | | | | | 1 | 2 | | | | | | | | | | | | | | | | |
| (B13) | 2.2.12 Direct gear | B | 4 | | | | | | | | | | | | | 1 | 2 | 3 | | | | | | | | | | | | | | | |
| – | 2.2.12 Clutch gear1 | B | 5 | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | |
| (B17) | 2.2.13 Link lever | B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (B18) | 2.2.14 Cassette gear | B | 2 | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| (B20) | 2.2.14 Control cam | B | 2 | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| (B21) | 2.2.14 Worm gear | B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (T10) | - Lid guide | T/B | 5 | | | | | | | | | 1 | 2 | 3 | | | | | | | 4 | | | | | | | | | | | | |
| (B7) | 2.2.15 Control bracket1 | B | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (B8) | 2.2.15 Control plate | B | 6 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | | | | | | | | | | | |
| (B5) | 2.2.16 Loading arm gear (supply side) | B | 7 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | | | | | | | | | | |
| (B4) | 2.2.16 Loading arm gear (take-up side) | B | 8 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | 7 | | | | | | | | | |
| – | 2.2.16 Loading arm gear shaft | B | 9 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | 7 | 8 | | | | | | | | |
| (B11) | 2.2.17 Take-up lever | T/B | 7 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | | | | | | | | | | |
| (B10) | 2.2.17 Take-up head | T/B | 8 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | | | 7 | | | | | | | |
| – | 2.2.17 Control plate guide | T/B | 8 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | | | 7 | | | | | | | |
| (B3) | 2.2.18 Capstan brake assembly | T/B | 7 | | | | | | | | | | | | | 1 | 2 | 3 | | 4 | | 5 | 6 | | | | | | | | | | |
| (T14) | 2.2.19 Sub brake assembly(take-up side) | T/B | 15 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | | | | | | | |
| (T15) | 2.2.20 Main brake assembly(take-up side) | T/B | 16 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | 15 | | | | | | |
| (T19) | 2.2.20 Main brake assembly(supply side) | T/B | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | | | | |
| (T13) | 2.2.20 Reel disk (take-up side) | T/B | 16 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | 15 | | | | | | |
| (T22) | 2.2.21 Tension brake assembly | T/B | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | | | | |
| (T20) | 2.2.21 Reel disk (supply side) | T/B | 10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | 9 | | | |
| (T24) | 2.2.21 Tension arm assembly | T/B | 10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | 9 | | | |
| (B9) | 2.2.21 Tension arm bearing | T/B | 10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | 9 | | | |
| (T18) | 2.2.22 Idler lever | T/B | 17 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | | | | 15 | 16 | | |
| (T16) | 2.2.22 Idler arm assembly | T/B | 18 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | | | | 15 | 16 | 17 | |
| (B19) | - Brake lever | T/B | 18 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | 15 | 16 | 17 | | | | |
| (B16) | - Rotary encoder guide | T/B | 19 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | 9 | 10 | 11 | | 12 | | 13 | 14 | | | | 15 | 16 | 17 | | | | 18 |

### 2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

**Note:** ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

### 3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

| Type | Name | Serial No. | Symbols on the disassembly diagrams |
|---|---|---|---|
| Grease | Maltemp SH-P | KYODO-SH-P | AA |
| Oil | Cosmohydro HV56 | COSMO-HV56 | BB |

Table 2-1-2 Grease and oil used for the unit

### 4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

| System | Parts Name | Operation Hours | |
|---|---|---|---|
| | | ~1000H | ~2000H |
| Tape transport | Upper drum assembly | ★○ | ○ |
| | A/C head | ★○ | ★○ |
| | Lower drum assembly | ★ | ★○ |
| | Pinch roller arm assembly | ★ | ★ |
| | Full erase head | ★ | ★ |
| | Tension arm assembly | ★ | ★ |
| | Capstan motor (Shaft) | ★ | ★ |
| | Guide arm assembly | ★ | ★ |
| Drive | Capstan motor | | ○ |
| | Capstan brake assembly | | ○ |
| | Main brake assembly | | ○ |
| | Belt (Capstan) | ○ | ○ |
| | Belt (Loading motor) | | ○ |
| | Loading motor | | ○ |
| | Clutch unit | | ○ |
| | Worm gear | | ○ |
| | Control plate | | ○ |
| Other | Brush | ★○ | ★○ |
| | Tension brake assembly | ○ | ○ |
| | Rotary encoder | | ○ |

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

## 2.2 REPLACEMENT OF MAJOR PARTS

### 2.2.1 Before Starting Disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

(For information on phase matching of the mechanism, see the instructions on how to install individual parts.)

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

### 2.2.2 How to Set the Mechanism Assembling Mode

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1.)

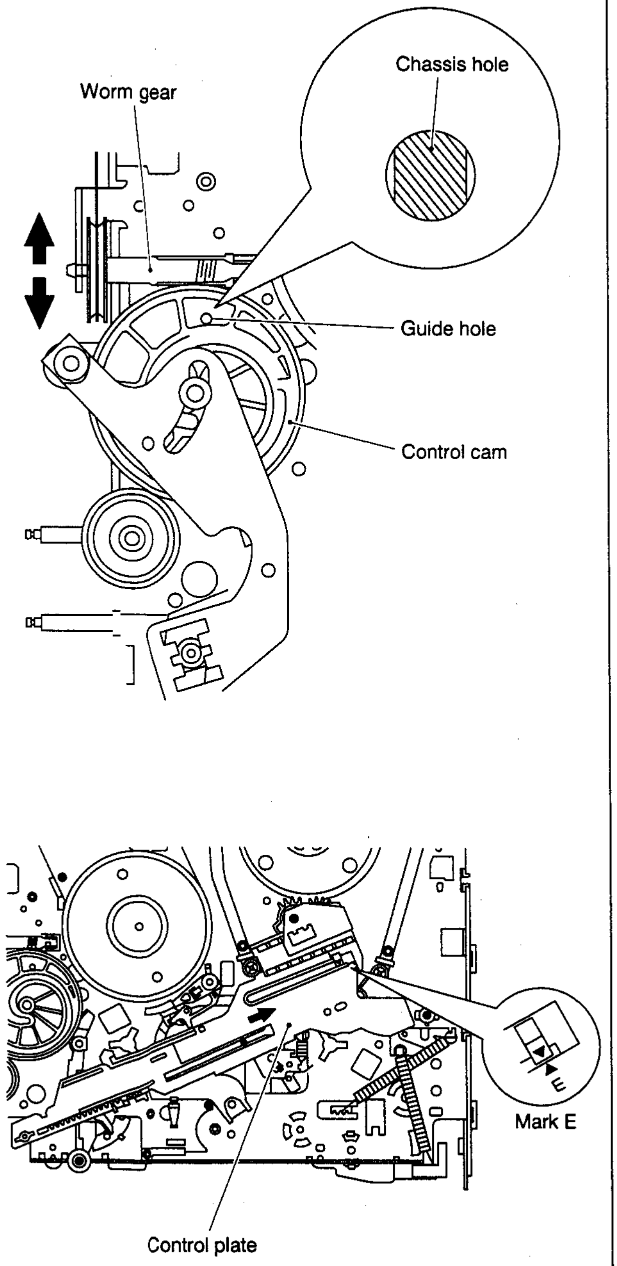

Chassis hole
Worm gear
Guide hole
Control cam
Mark E
E
Control plate

Fig. 2-2-1

### 2.2.3 Cassette Holder Assembly

#### 1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-2.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

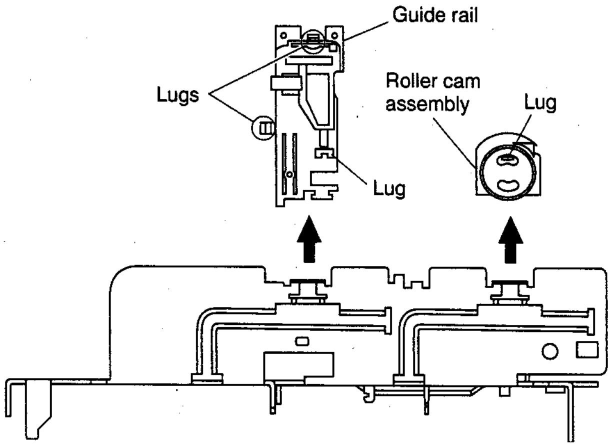

Guide rail
Lugs
Roller cam assembly
Lug
Lug

Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3.)

(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3.)

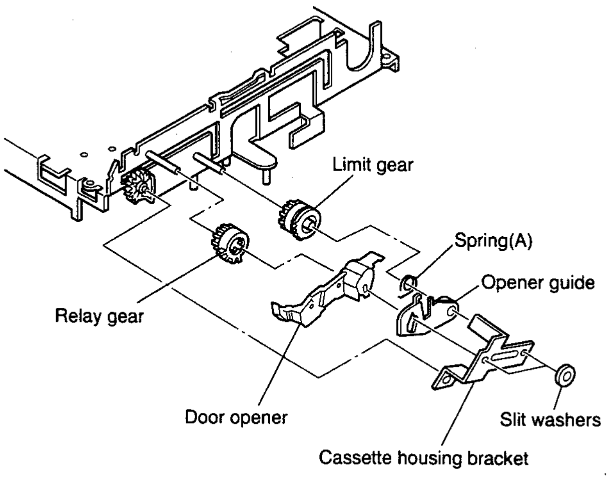

Limit gear
Spring(A)
Opener guide
Relay gear
Door opener
Slit washers
Cassette housing bracket

Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-4.)

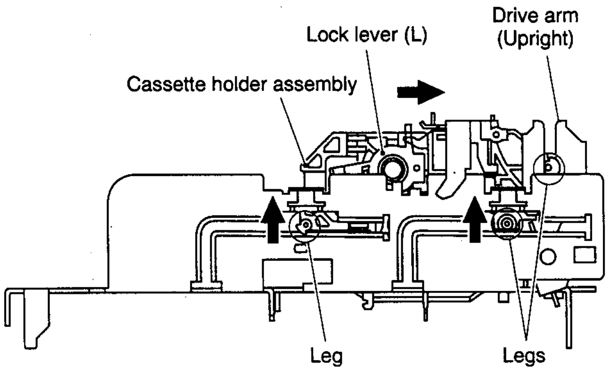

Drive arm
(Upright)
Lock lever (L)
Cassette holder assembly
Leg
Legs

Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5 and Fig.2-2-6.)

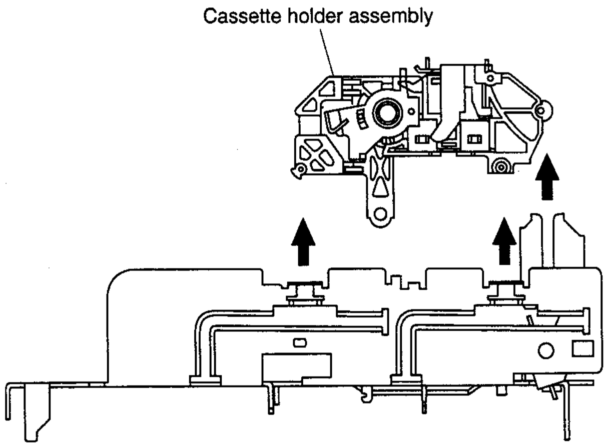

Cassette holder assembly

Fig. 2-2-5

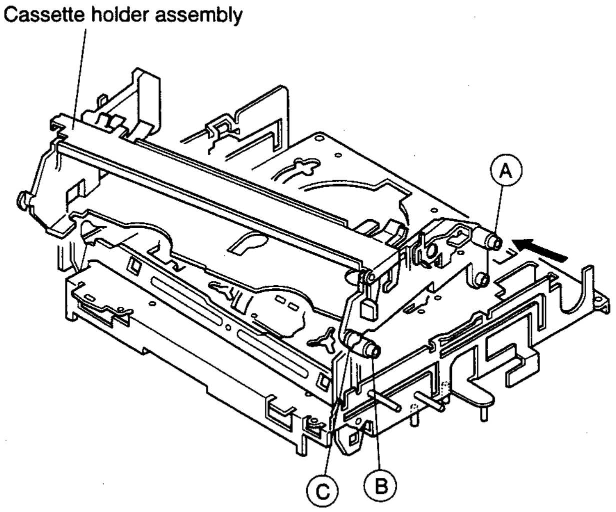

Cassette holder assembly
Ⓐ
Ⓒ
Ⓑ

Fig. 2-2-6

(6) Draw out the drive gear, and remove the drive arm.

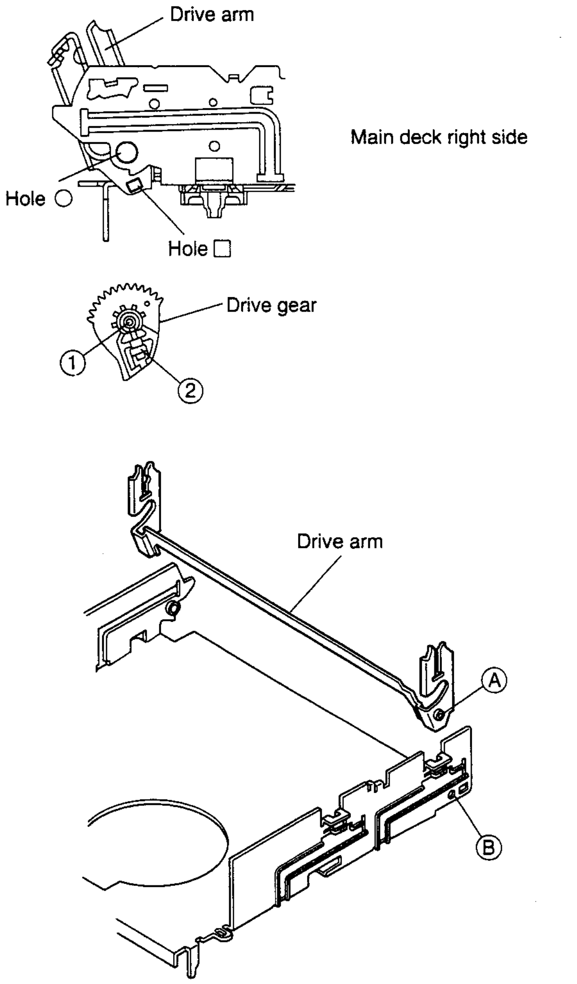

Drive arm
Main deck right side
Hole ○
Hole □
Drive gear
①
②
Drive arm
Ⓐ
Ⓑ

Fig. 2-2-7

## 2. How to install (Phase matching)

(1) Insert the section Ⓐ of the drive arm into the section Ⓑ of the main deck.

(2) Insert the section ① of the drive gear into the round hole, and the section ② into the square hole on the drive arm. (See Fig.2-2-7.)

(3) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-8.)

(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-8.)

(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-9.)

(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.

(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-10.)

(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-10.)

(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

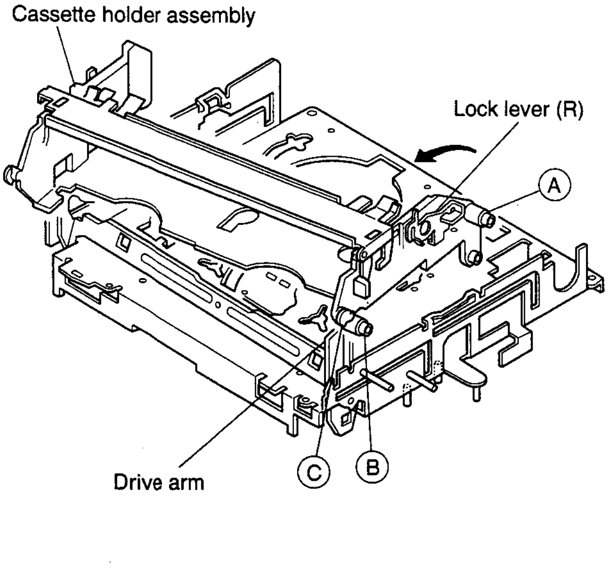

Cassette holder assembly
Lock lever (R)
Ⓐ
Drive arm
Ⓒ
Ⓑ

Fig. 2-2-8

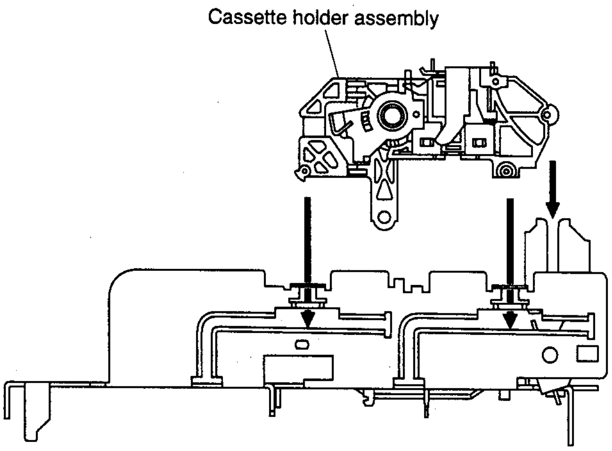

Cassette holder assembly

Fig. 2-2-9

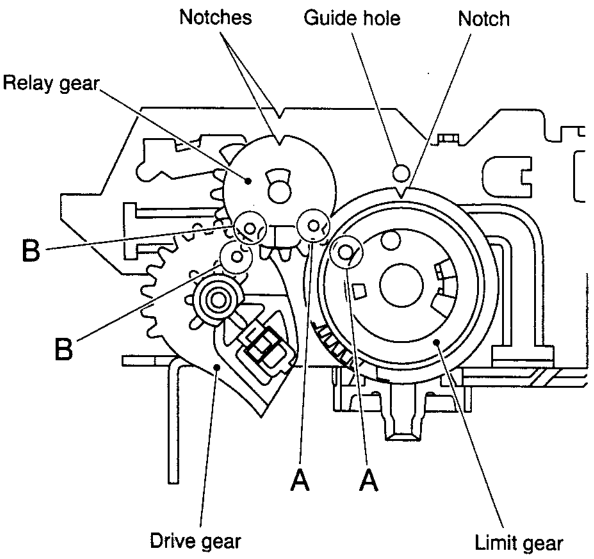

Notches
Guide hole
Notch
Relay gear
B
B
A
A
Drive gear
Limit gear

Fig. 2-2-10

### 2.2.4 Pinch Roller Arm Assembly

**1. How to remove**

(1) Remove the spring from the hook of the press lever assembly.

(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-11.)

(3) Remove the pinch roller arm assembly by pulling it up.

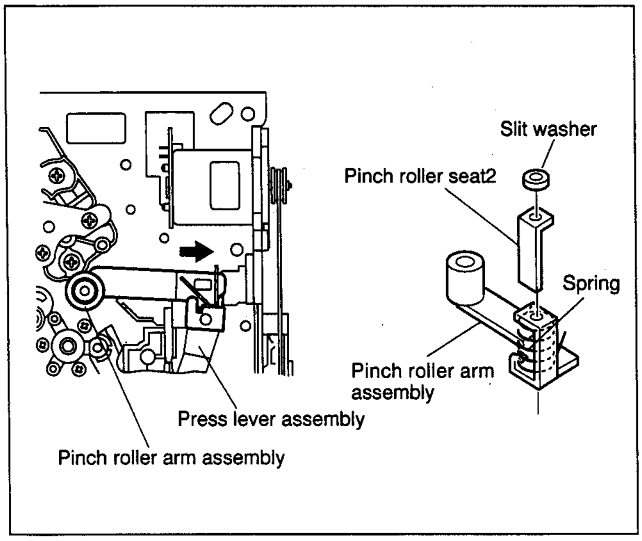

Slit washer
Pinch roller seat2
Spring
Pinch roller arm assembly
Press lever assembly
Pinch roller arm assembly

Fig. 2-2-11

### 2.2.5 Guide Arm Assembly and Press Lever Assembly

**1. How to remove**

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.

(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-12.)

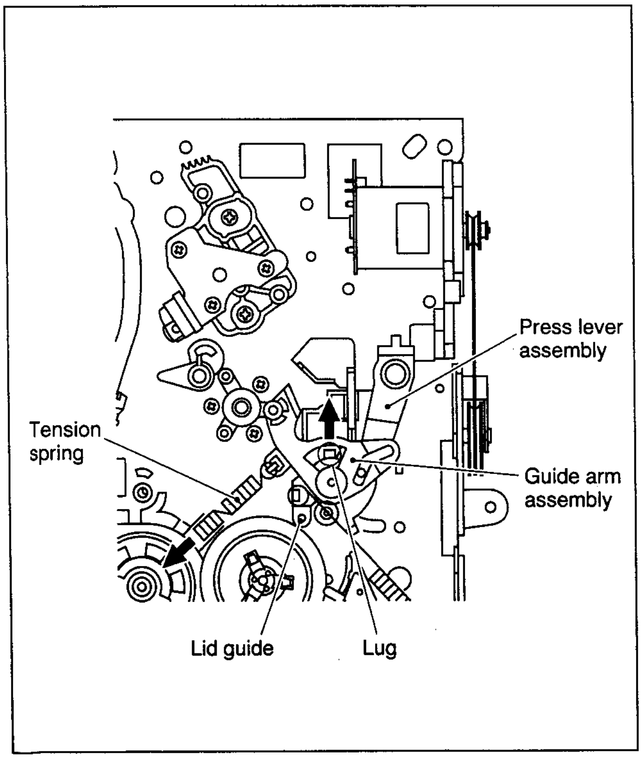

Press lever assembly
Tension spring
Guide arm assembly
Lid guide
Lug

Fig. 2-2-12

### 2.2.6 Audio Control Head

**1. How to remove**

(1) Remove the two screws (A) and remove the audio control head together with the head base.

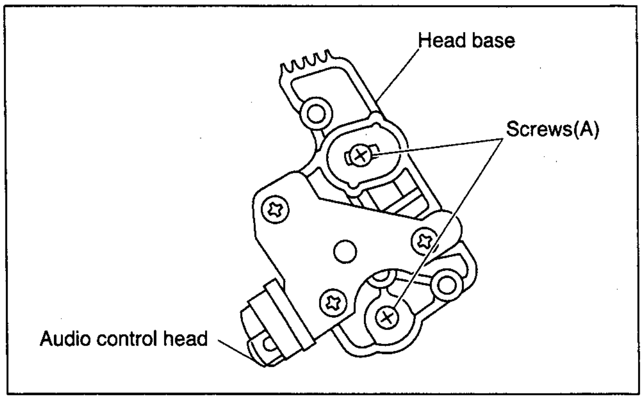

Head base
Screws(A)
Audio control head

Fig. 2-2-13

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

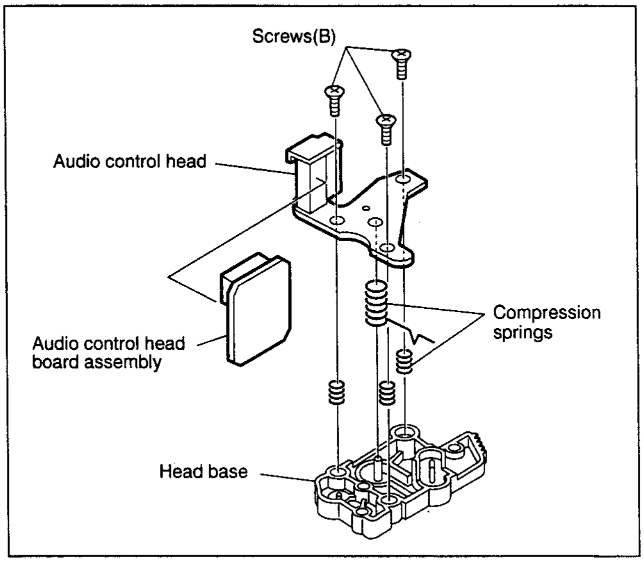

Screws(B)
Audio control head
Compression springs
Audio control head board assembly
Head base

Fig. 2-2-14

**2. How to install**

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-15. Also make sure that the screw center is brought into alignment with the center position of the slot.

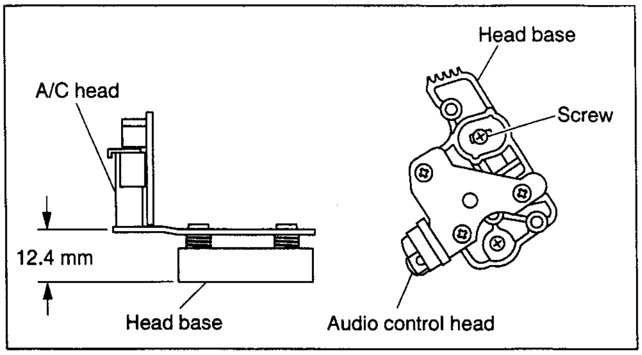

Head base
A/C head
Screw
12.4 mm
Head base
Audio control head

Fig. 2-2-15

### 2.2.7 Loading Motor

**1. How to remove**

(1) Remove the belt wound around the worm gear.

(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.

(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)

(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-16.

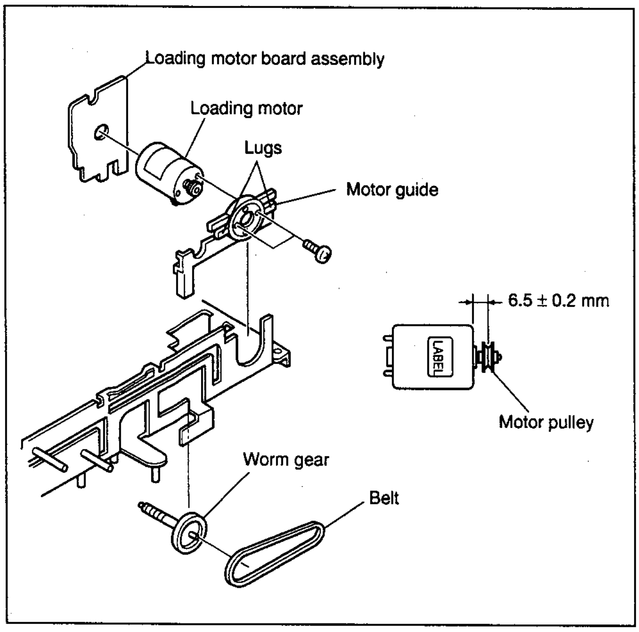


Fig. 2-2-16

### 2.2.8 Capstan Motor

**1. How to remove**

(1) Remove the belt (capstan) on the mechanism assembly back side.

(2) Remove the three screws (A) and remove the capstan motor.

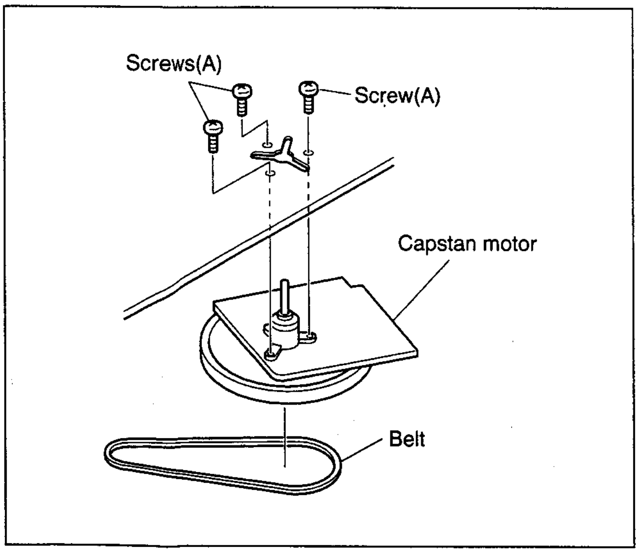


Fig. 2-2-17

**2. How to install (Centering the mounting position)**

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.

(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.

(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.)
Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-18.

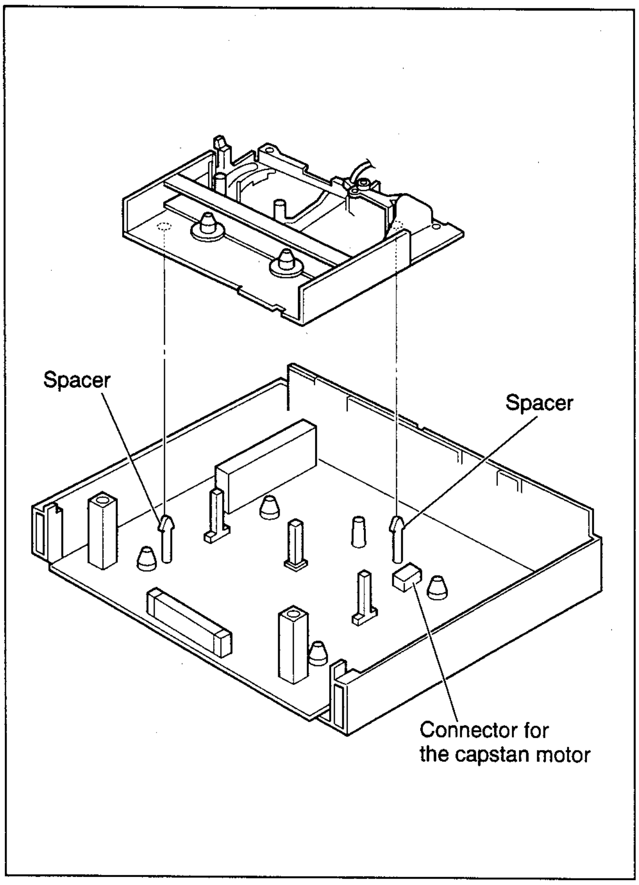


Fig. 2-2-18

(3) Making sure that the connector for the capstan motor is correctly mounted, and securely tighten the three screws (A).

**Note:** ***When the capstan motor has been replaced with a new one, perform recording in the EP(or LP) mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

### 2.2.9 Pole Base Assembly (supply or take-up side)

#### 1. How to remove

(1) Remove the UV catcher 2 on the removal side by loosening the screw (A).

(2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.

(3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the "Procedures for Lowering the Cassette holder assembly" of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

**NOTE:** ***After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.***

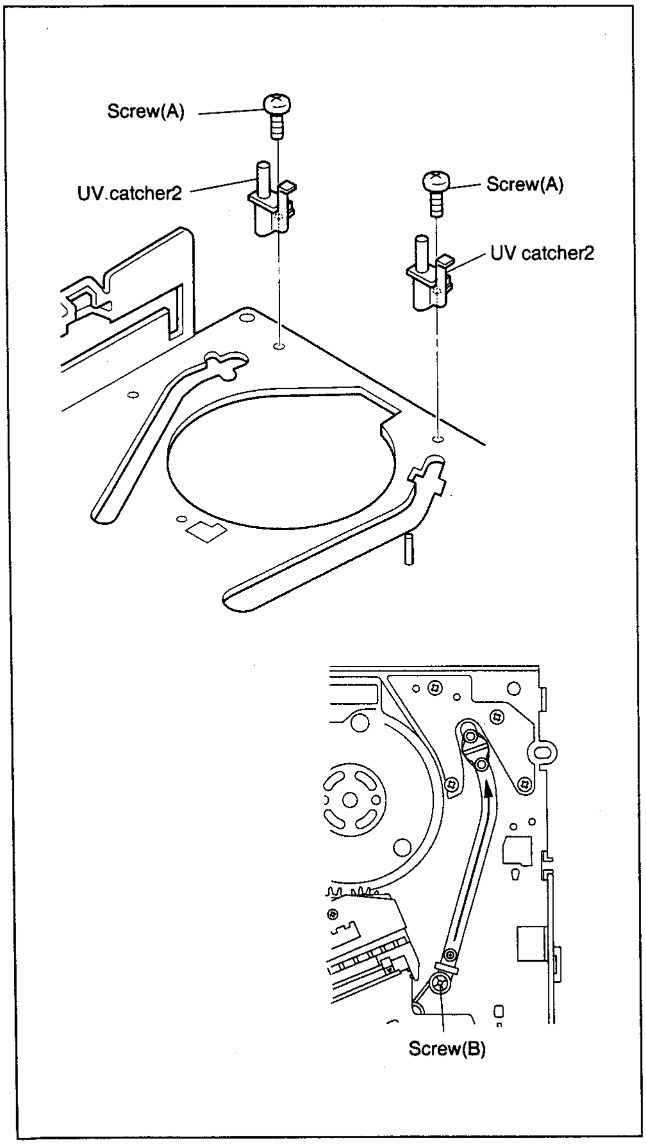

Screw(A)
UV.catcher2
Screw(A)
UV catcher2
Screw(B)

Fig. 2-2-19

### 2.2.10 Rotary Encoder

#### 1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-20.)

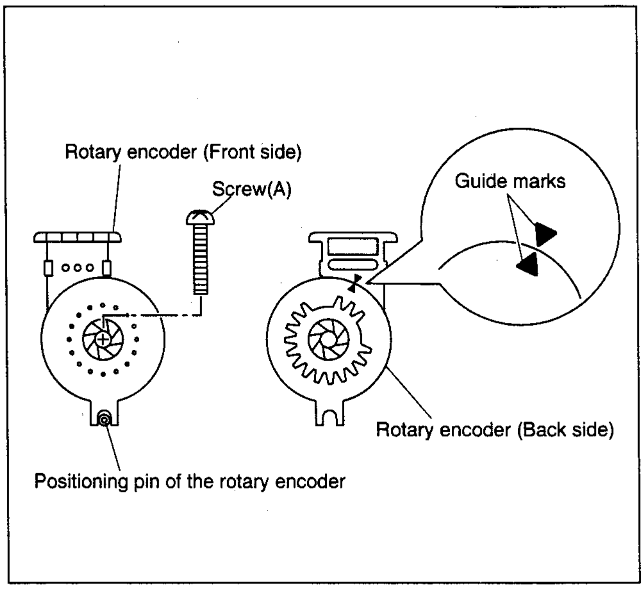

Rotary encoder (Front side)
Screw(A)
Guide marks
Rotary encoder (Back side)
Positioning pin of the rotary encoder

Fig. 2-2-20

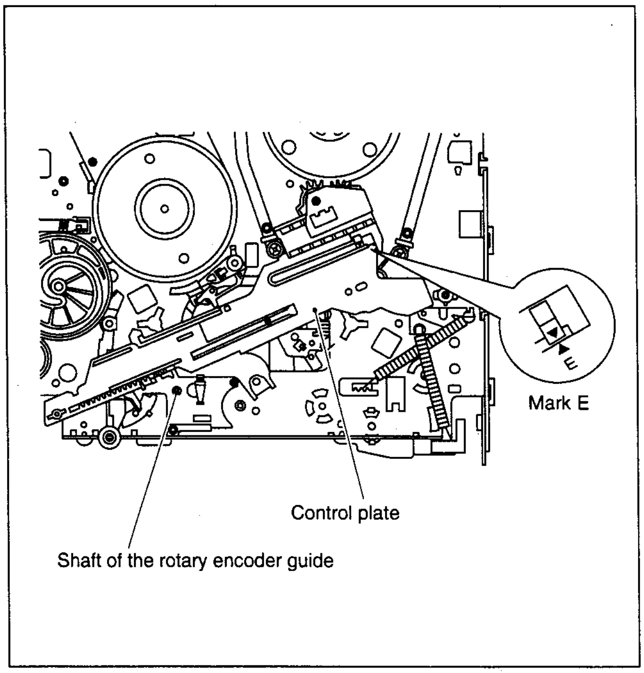

E
Mark E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-21

#### 2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-20. (See Fig. 2-2-20 and Fig. 2-2-21.)

(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

### 2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.
(2) Remove the slit washer and remove the clutch unit.

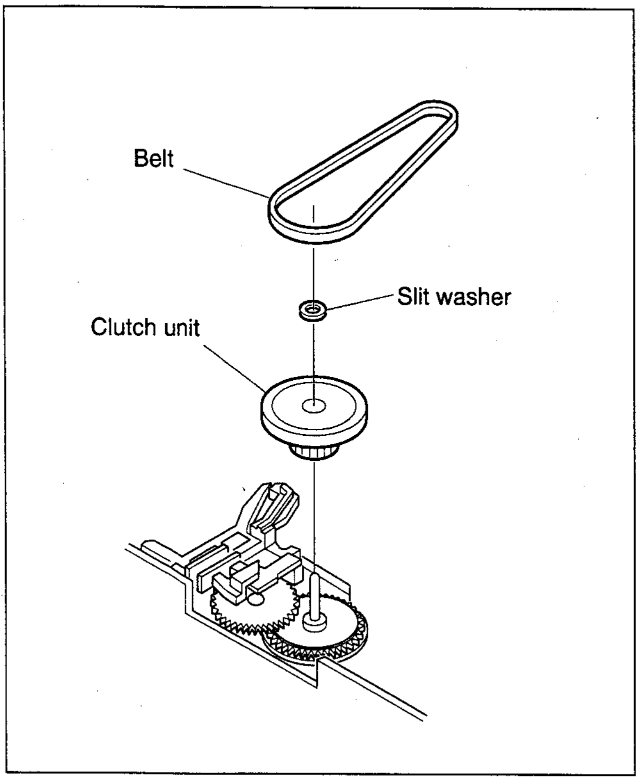

Belt
Slit washer
Clutch unit

Fig. 2-2-22

### 2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1

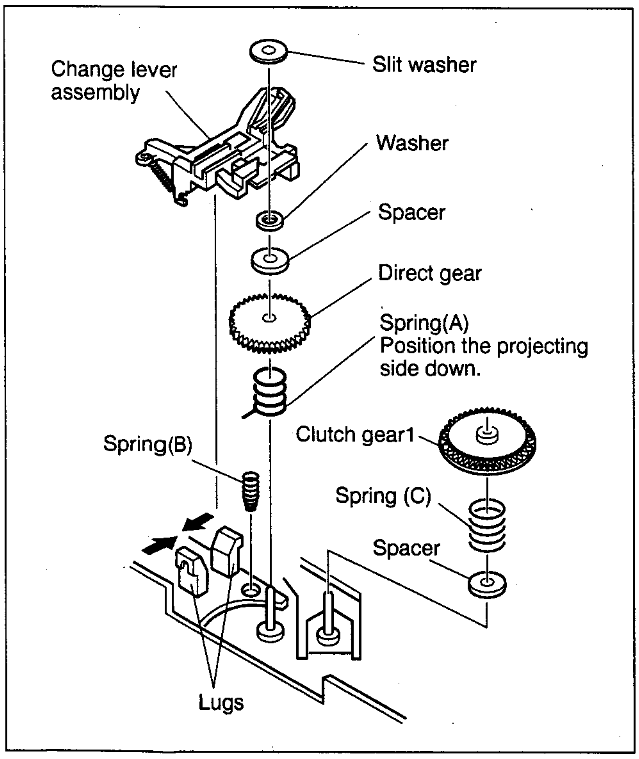

Change lever assembly
Slit washer
Washer
Spacer
Direct gear
Spring(A)
Position the projecting side down.
Spring(B)
Clutch gear1
Spring (C)
Spacer
Lugs

Fig. 2-2-23

**1. How to remove**

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.
(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-23.)

**2. How to install**

(1) Install the clutch gear1, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-23.)
(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the clutch gear1 and catch it from the both sides with the assembly. (See Fig.2-2-24.)

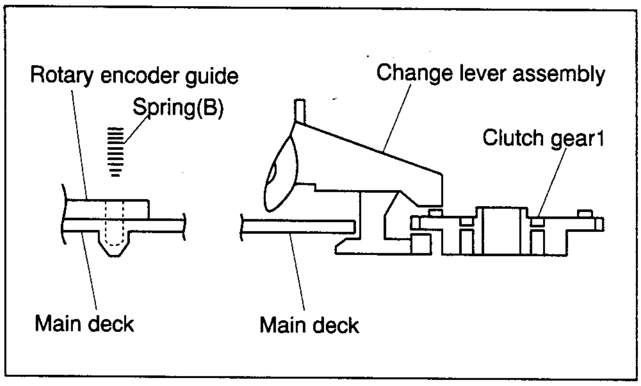

Rotary encoder guide
Spring(B)
Change lever assembly
Clutch gear1
Main deck
Main deck

Fig. 2-2-24

### 2.2.13 Link Lever

**1. How to remove**

(1) Remove the two slit washers.
(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

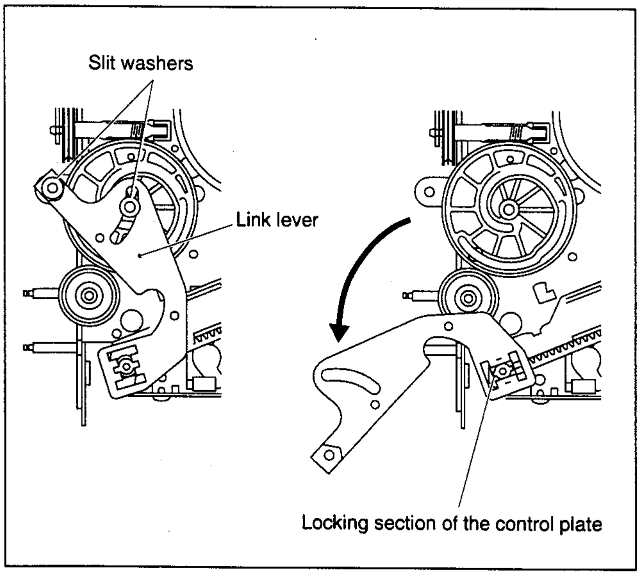

Slit washers
Link lever
Locking section of the control plate

Fig. 2-2-25

### 2. How to install (Phase matching)

(1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-26.)

(2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-27.)

(3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-25.)

(4) Rotate the link lever clockwise so that it is installed on the shafts in the center and on the left of the control cam.

(5) Fasten the slit washers at these two points.

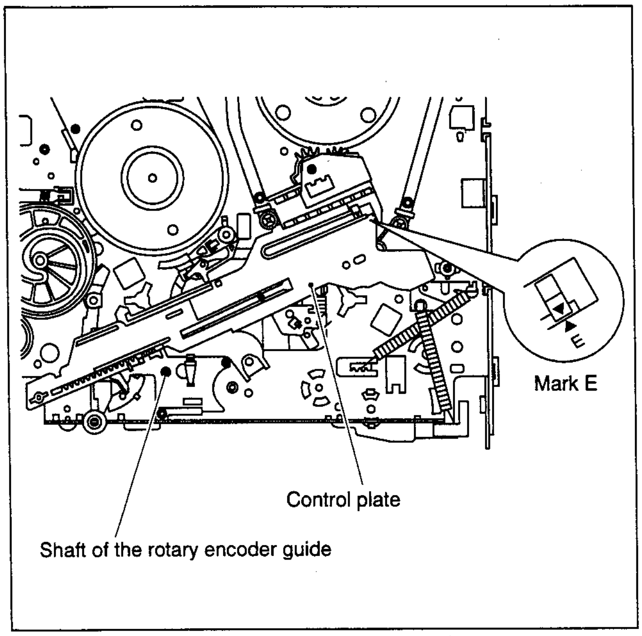

E
Mark E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-26

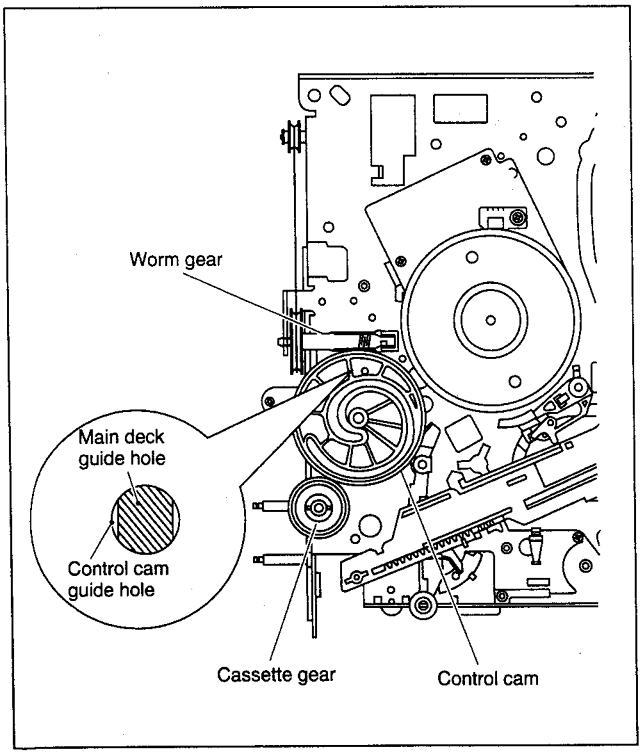

Worm gear
Main deck guide hole
Control cam guide hole
Cassette gear
Control cam

Fig. 2-2-27

## 2.2.14 Cassette Gear, Control Cam and Worm Gear

### 1. How to remove

(1) Remove the control cam by lifting it.

(2) Open the two lugs of the cassette gear outward and pull the latter off.

(3) Remove the belt wound around the worm gear and the loading motor.

(4) Open the lug of the lid guide outward and remove the worm gear.

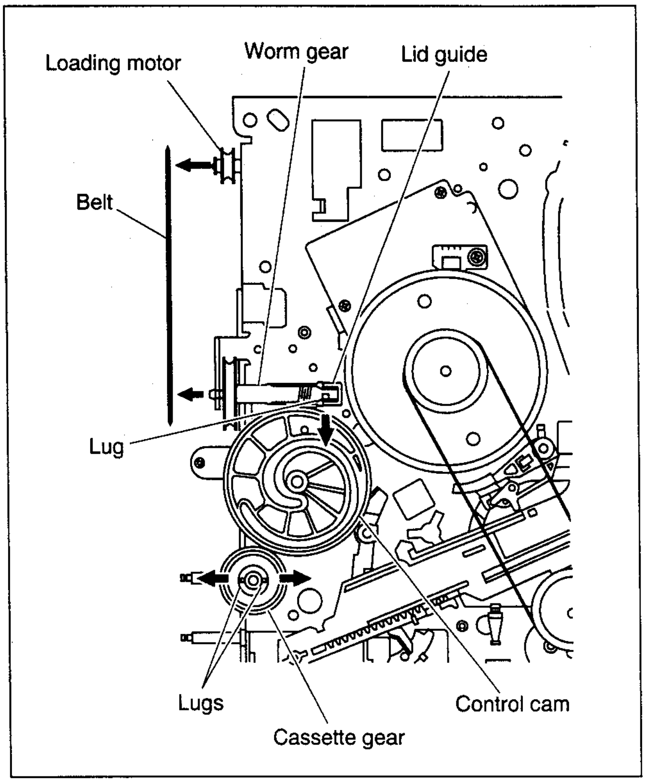

Loading motor
Worm gear
Lid guide
Belt
Lug
Lugs
Control cam
Cassette gear

Fig. 2-2-28

## 2.2.15 Control Plate

### 1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.

(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-29.)

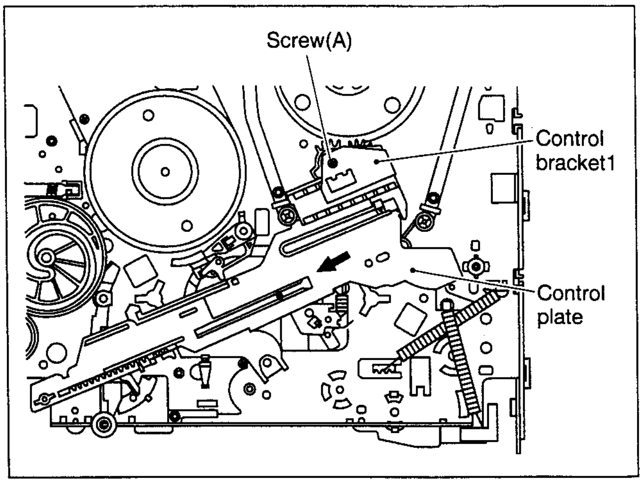

Screw(A)
Control bracket1
Control plate

Fig. 2-2-29

## 2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-30 (to the left of center of the R section).

(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-31.)

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-31.)

(5) Pull off the hexagonal wrench for positioning.

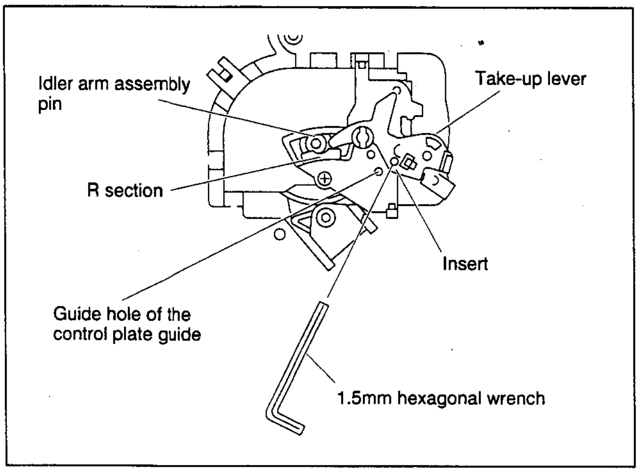

Idler arm assembly pin
Take-up lever
R section
Insert
Guide hole of the control plate guide
1.5mm hexagonal wrench

Fig. 2-2-30

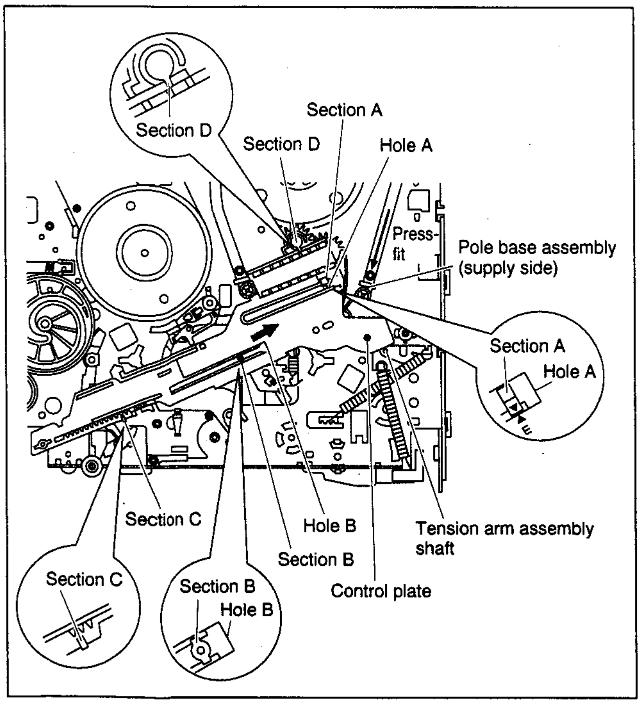

Section D
Section A
Section D
Hole A
Press-fit
Pole base assembly (supply side)
Section A
Hole A
E
Section C
Hole B
Section B
Tension arm assembly shaft
Control plate
Section C
Section B
Hole B

Fig. 2-2-31

### 2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft

## 1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-32.)

(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-32.)

(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-32 and Fig. 2-2-33.)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

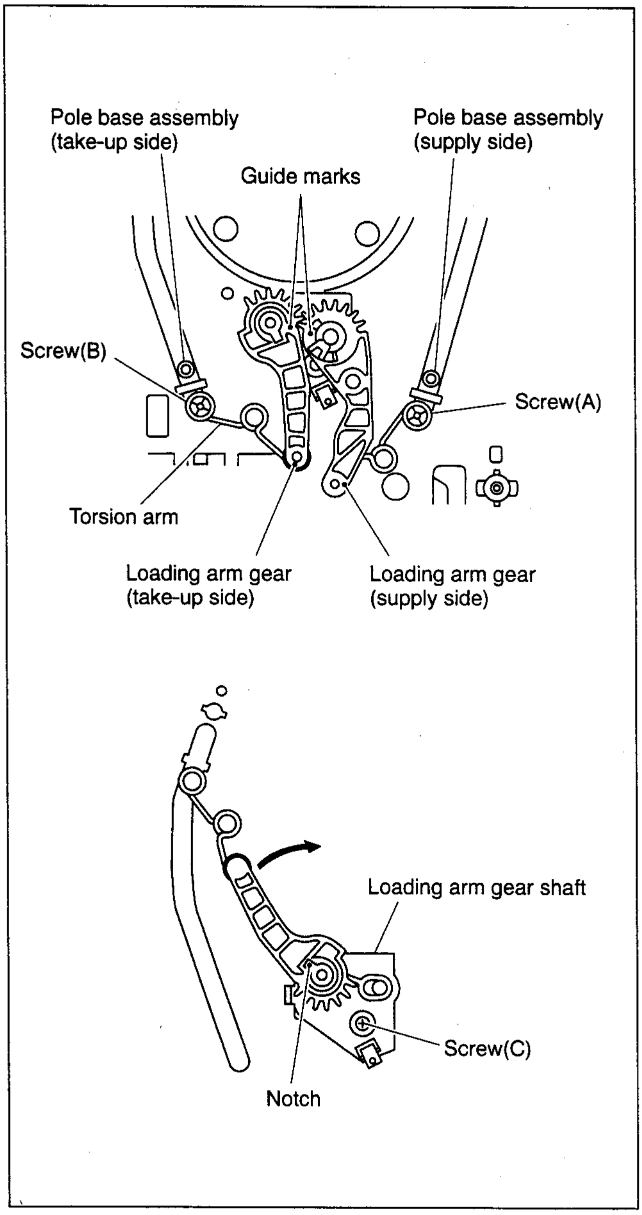

Pole base assembly (take-up side)
Pole base assembly (supply side)
Guide marks
Screw(B)
Screw(A)
Torsion arm
Loading arm gear (take-up side)
Loading arm gear (supply side)
Loading arm gear shaft
Screw(C)
Notch

Fig. 2-2-32

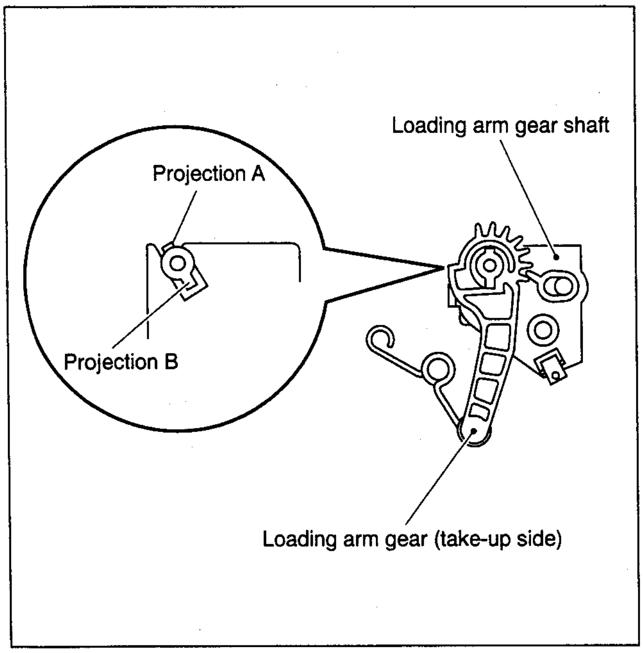

Loading arm gear shaft
Projection A
Projection B
Loading arm gear (take-up side)

Fig. 2-2-33

### 2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-33.)

(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).

(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-32.)

## 2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove the screw (A).

(4) Align the idler arm assembly pin in the center of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

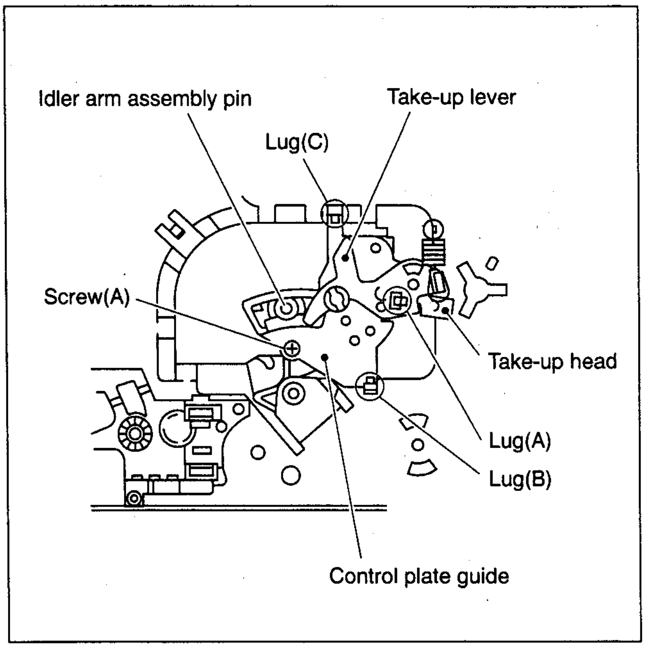

Idler arm assembly pin
Take-up lever
Lug(C)
Screw(A)
Take-up head
Lug(A)
Lug(B)
Control plate guide

Fig. 2-2-34

## 2.2.18 Capstan Brake Assembly

### 1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-35.)

(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.

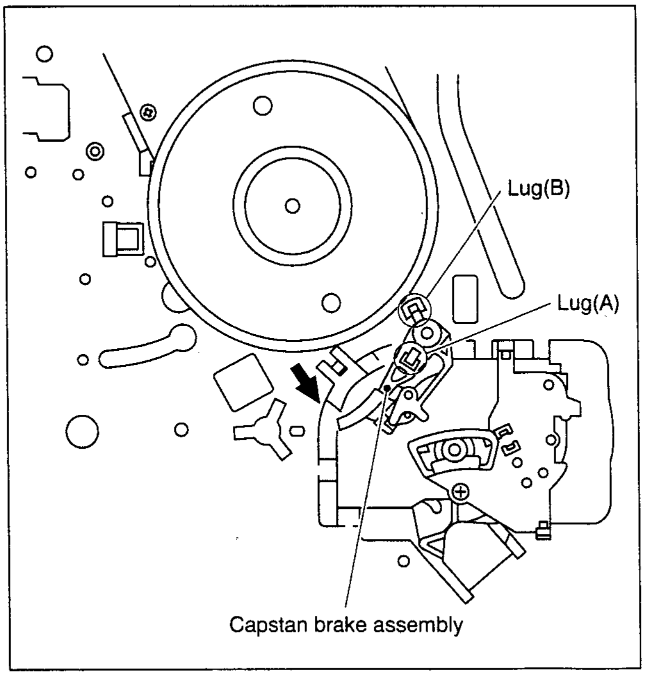

Lug(B)
Lug(A)
Capstan brake assembly

Fig. 2-2-35

### 2.2.19 Sub Brake Assembly (take-up side)

**1. How to remove**

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).

(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.

(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).

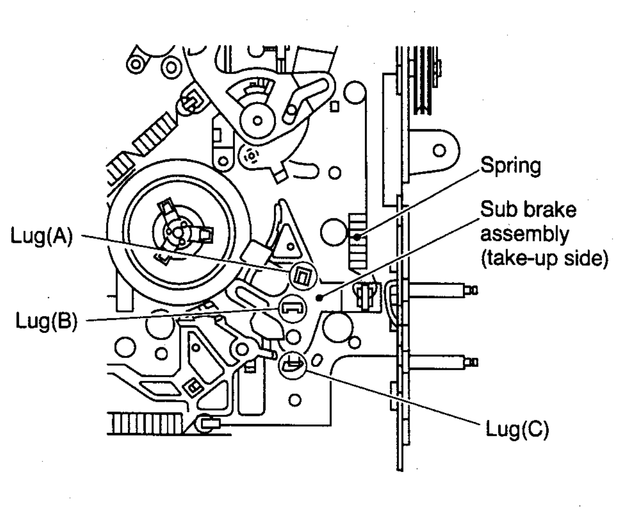

Spring
Sub brake assembly (take-up side)
Lug(A)
Lug(B)
Lug(C)

Fig. 2-2-36

### 2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side)

**1. How to remove**

(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).

(2) Remove the spring attached to the main brake assembly.

(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.

(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-37.)

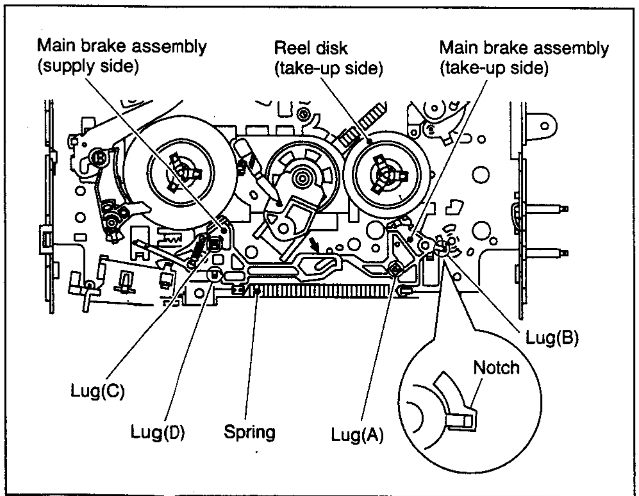

Main brake assembly (supply side)
Reel disk (take-up side)
Main brake assembly (take-up side)
Lug(B)
Notch
Lug(C)
Lug(D)
Spring
Lug(A)

Fig. 2-2-37

(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-38.)

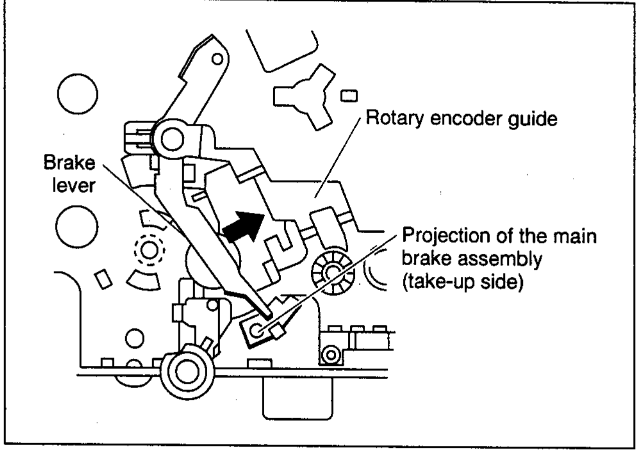

Rotary encoder guide
Brake lever
Projection of the main brake assembly (take-up side)

Fig. 2-2-38

### 2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly

**1. How to remove**

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.

(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).

(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-39.)

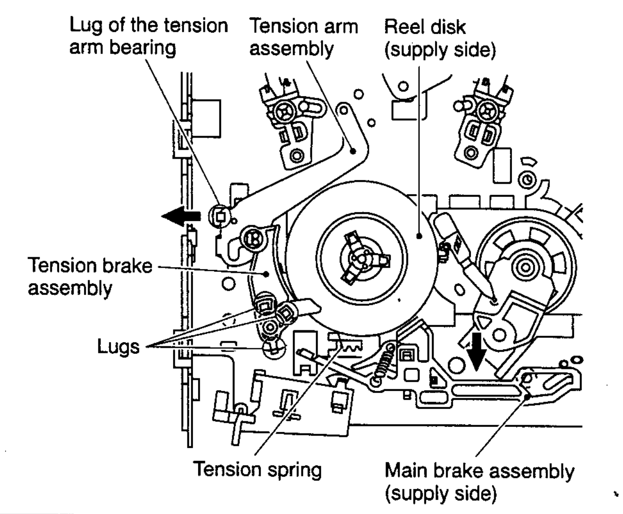

Lug of the tension arm bearing
Tension arm assembly
Reel disk (supply side)
Tension brake assembly
Lugs
Tension spring
Main brake assembly (supply side)

Fig. 2-2-39

### 2.2.22 Idler Lever, Idler Arm Assembly

**1. How to remove**

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.

(2) Remove the slit washer and pull out the idler arm assembly.

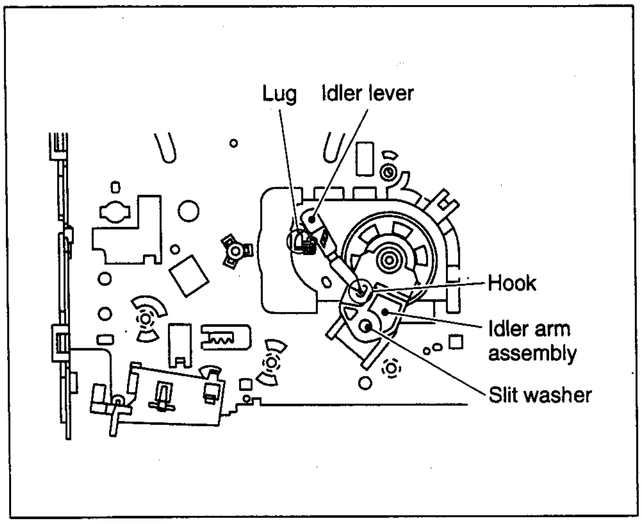

Lug
Idler lever
Hook
Idler arm assembly
Slit washer

Fig. 2-2-40

### 2.2.23 Stator Assembly

(1) Remove the flat cable.

(2) Remove the two screws (A).

(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)

(4) After installation, be sure to perform the PB switching point adjustment according to the electrical adjustment procedure.

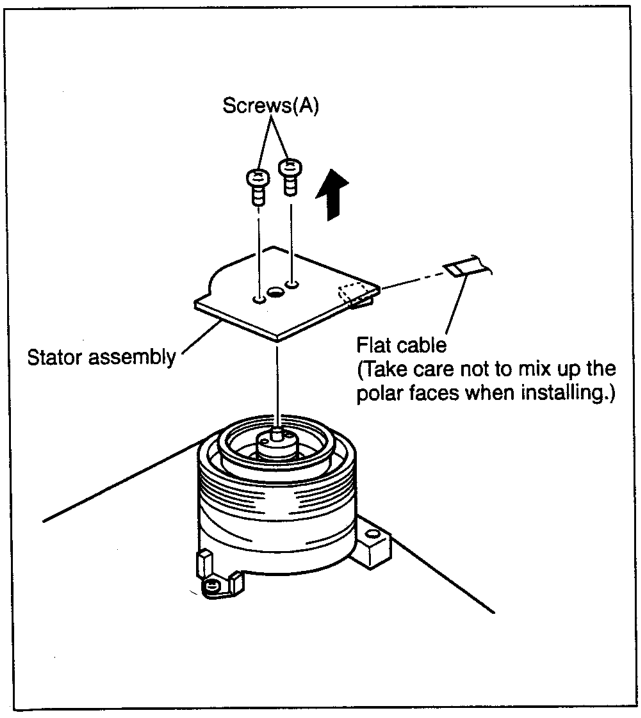

Screws(A)
Stator assembly
Flat cable
(Take care not to mix up the polar faces when installing.)

Fig. 2-2-41

### 2.2.24 Rotor Assembly

(1) Remove the stator assembly.

(2) Remove the two screws (B) and remove the rotor assembly.

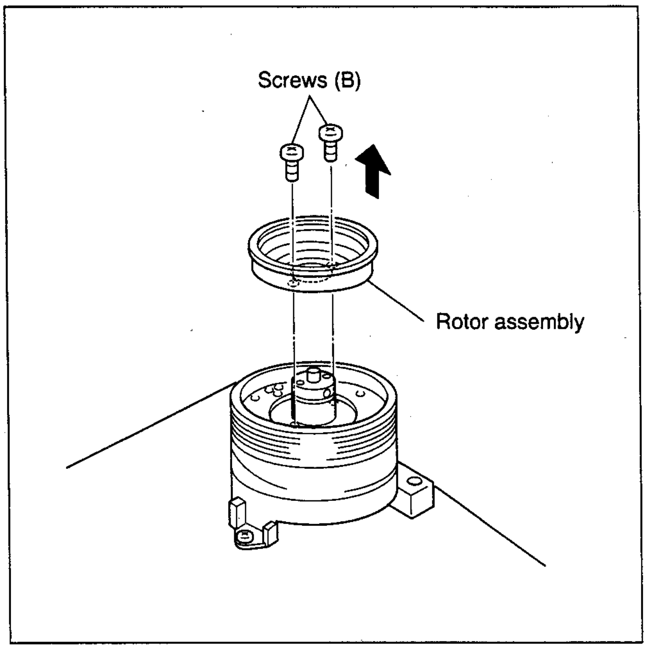

Screws (B)
Rotor assembly

Fig. 2-2-42

**Note:** *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-43.

(4) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-43.)

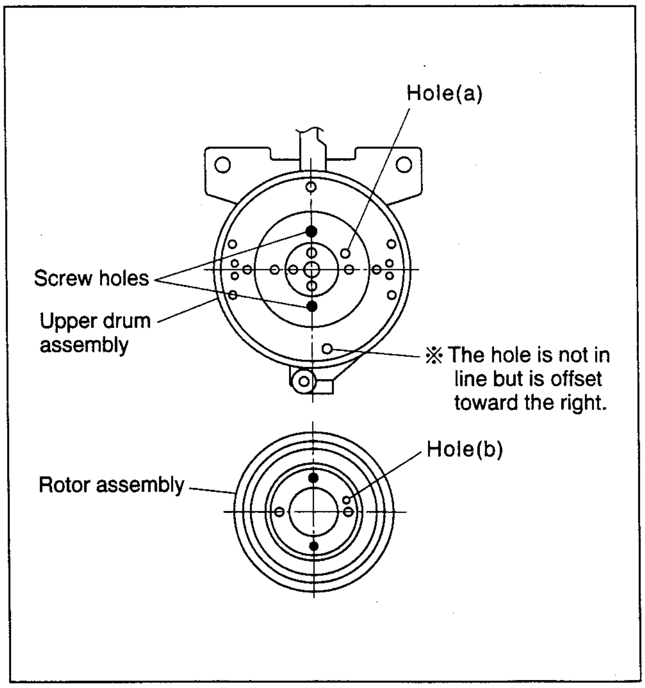

Hole(a)
Screw holes
Upper drum assembly
※The hole is not in line but is offset toward the right.
Hole(b)
Rotor assembly

Fig. 2-2-43

### 2.2.25 Upper Drum Assembly

#### 1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

**Note:** *When replacement is required, control the up-down movement of the brush. Never apply grease.*

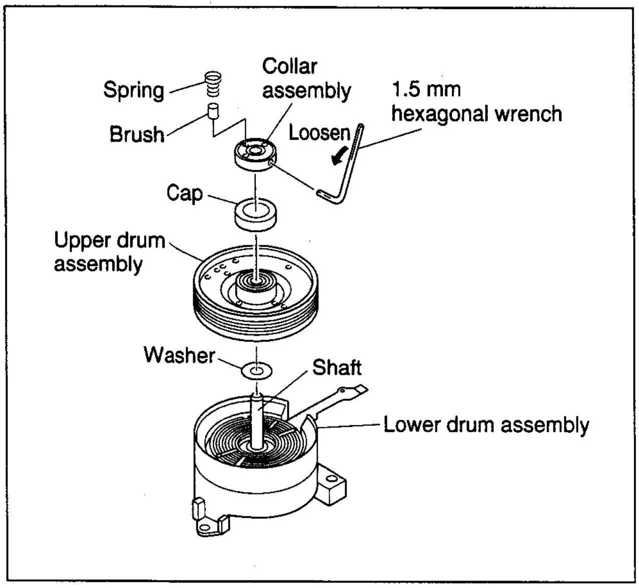

Spring
Collar assembly
1.5 mm hexagonal wrench
Brush
Loosen
Cap
Upper drum assembly
Washer
Shaft
Lower drum assembly

Fig. 2-2-44

#### 2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-45.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-44.)

**Note:** *When replacing the upper drum assembly, replace it the together with the washer.*

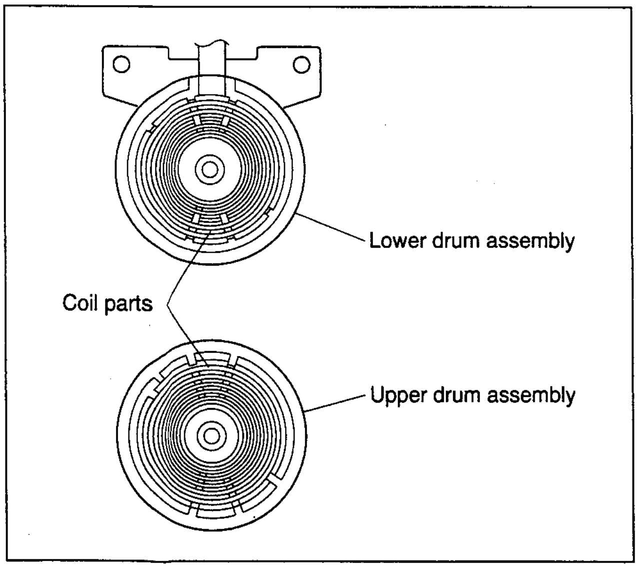

Lower drum assembly
Coil parts
Upper drum assembly

Fig. 2-2-45

(3) Install the cap to the upper drum assembly.
(4) Position the collar assembly as indicated in Fig.2-2-46 while controlling its up- down movement.

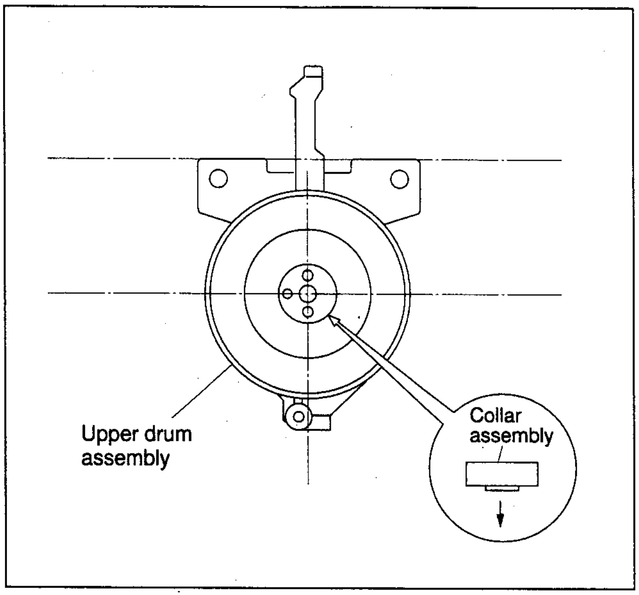

Upper drum assembly
Collar assembly

Fig. 2-2-46

(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

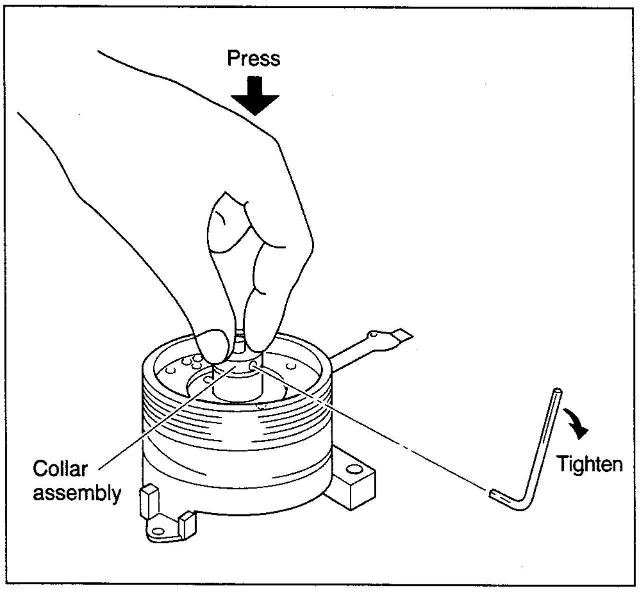

Press
Collar assembly
Tighten

Fig. 2-2-47

(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.
(7) Install the rotor assembly and stator assembly according to Fig 2-2-41 and 2-2-42.
(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.
    - PB switching point adjustment
    - Slow tracking adjustment
    - Compatibility adjustment (Be sure to check for compatibility for the EP (or LP) mode.)

## 2.3 COMPATIBILITY ADJUSTMENT

**Notes:** • *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*

• *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

### 2.3.1 Checking/Adjustment of FM Waveform Linearity

| | |
|---|---|
| Signal (A1)<br>(A2) | • Alignment tape [MHP]<br>• Alignment tape [MHP-L] |
| Mode (B) | • PB |
| Equipment (C) | • Oscilloscope |
| Measuring point (D) | • TP106 (PB. FM) [Main board] |
| External trigger (E) | • TP111 (D.FF) [Main board] |
| Adjustment part (F) | • Guide roller [Mechanism assembly] |
| Specified value (G) | • Flat V.PB FM waveform |
| Adjustment tool (H) | • Roller driver [PTU94002] |

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(4) Make sure that there is no significant level drop of the V.PB FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig. 2-3-1.)
(5) Reduce the V.PB FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver to make the V.PB FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (See Fig. 2-3-3.)
(6) Then play back the alignment tape (A2) and make sure that the V.PB FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play back the alignment tape (A2) again and confirm the V.PB FM waveform.

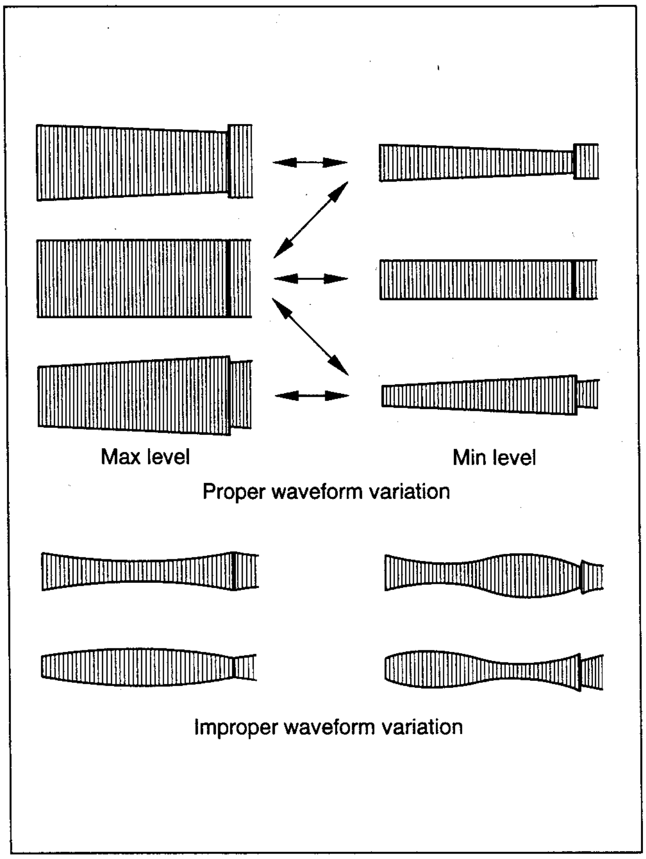


Fig. 2-3-1

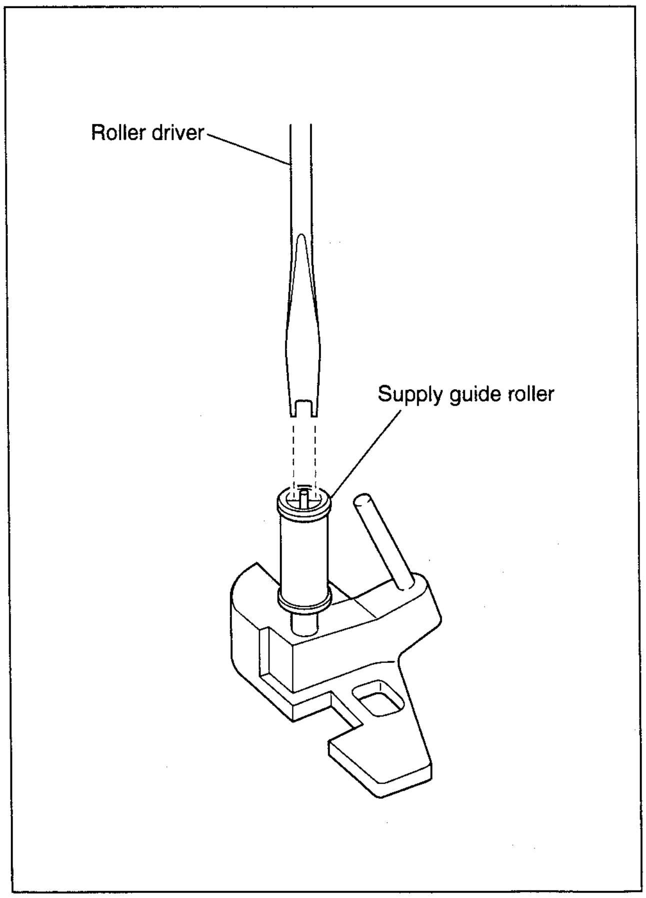


Fig. 2-3-2

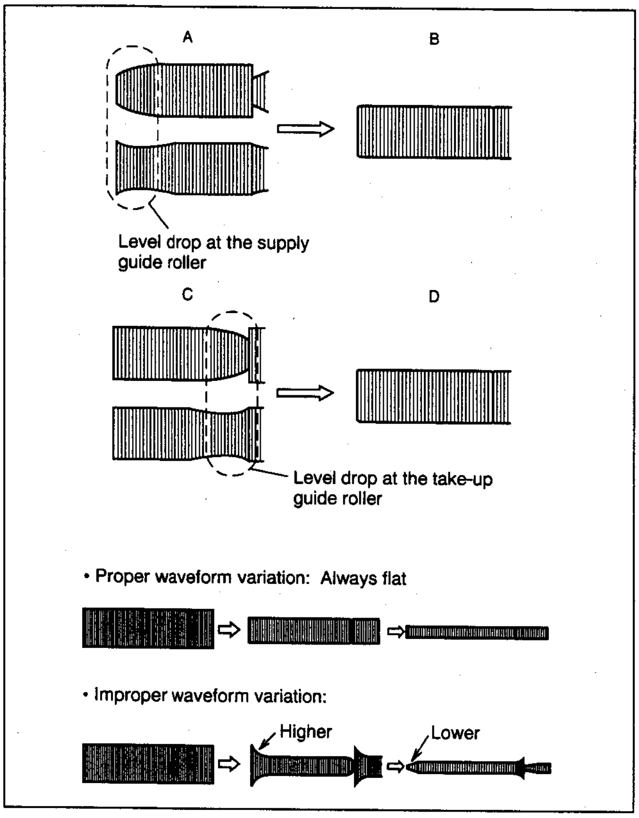

A
B
Level drop at the supply guide roller
C
D
Level drop at the take-up guide roller
• Proper waveform variation: Always flat
• Improper waveform variation:
Higher
Lower

Fig. 2-3-3

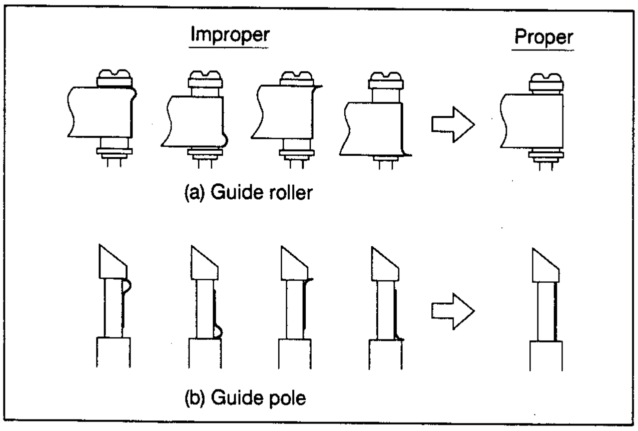

Improper
Proper
(a) Guide roller
(b) Guide pole

Fig. 2-3-4

### 2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

**Note:** *Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-15.)*

| | |
|---|---|
| Signal (A) | • Alignment tape [MHP] |
| Mode (B) | • PB |
| Equipment (C) | • Oscilloscope |
| Measuring point (D1)<br>(D2) | • AUDIO OUT terminal<br>• TP4001 (CTL. P) [Main board] |
| External trigger (E) | • TP111 (D.FF) [Main board] |
| Adjustment part (F) | • A/C head [Mechanism assembly] |
| Specified value (G) | • Maximum waveform |

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the AUDIO OUT waveform and Control pulse waveform at the measuring points (D1) and (D2) in the ALT mode.
(3) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(4) Adjust the AUDIO OUT waveform and Control pulse waveform by turning the screws (1), (2) and (3) little by little until both waveforms reach maximum. The screw (1) and (3) are for adjustment of tilt and the screw (2) for azimuth.

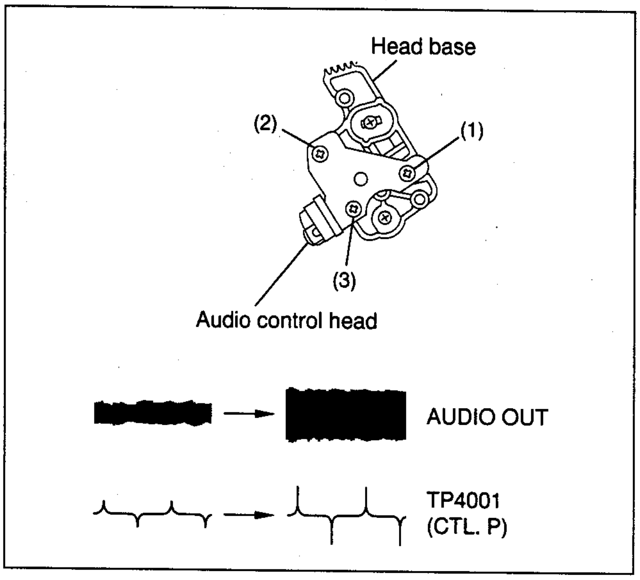

Head base
(2)
(1)
(3)
Audio control head
AUDIO OUT
TP4001
(CTL. P)

Fig. 2-3-5

### 2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

| | |
|---|---|
| Signal (A1)<br>(A2) | • Alignment tape [MHP]<br>• Alignment tape [MHP-L] |
| Mode (B) | • PB |
| Equipment (C) | • Oscilloscope |
| Measuring point (D) | • TP106 (PB. FM) [Main board] |
| External trigger (E) | • TP111 (D.FF) [Main board] |
| Adjustment part (F) | • A/C head base [Mechanism assembly] |
| Specified value (G) | • Maximum V.PB FM waveform |
| Adjustment tool (H) | • A/C head positioning tool [PTU94010] |

(1) Play back the alignment tape (A1).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(4) Loosen the screws (4) and (5), then set the A/C head positioning tool to the innermost projected part of the A/C head. (See Fig. 2-3-6.)
(5) Turn the A/C head positioning tool fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the V.PB FM waveform output level. Then tighten the screw (4) temporarily.

(6) Then play back the alignment tape (A2).
(7) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(8) Perform the tracking operation and make sure that the V.PB FM waveform is at its maximum.
(9) If it is not at maximum, loosen the temporarily tightened screw (4) and turn the A/C head positioning tool to bring the A/C head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

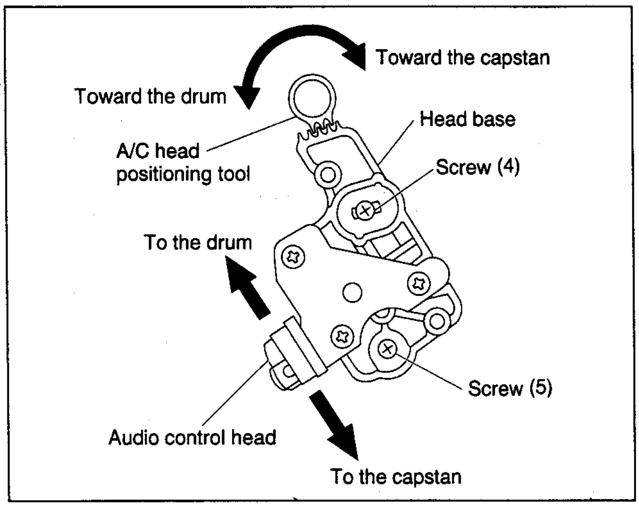

Toward the capstan
Toward the drum
Head base
A/C head positioning tool
Screw (4)
To the drum
Screw (5)
Audio control head
To the capstan

Fig. 2-3-6

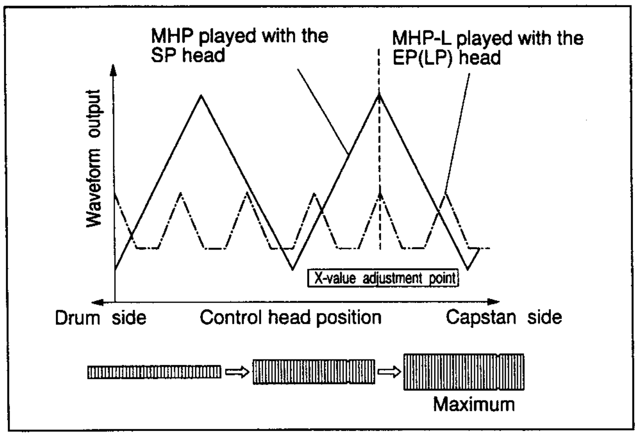


Fig. 2-3-7

### 2.3.4 Checking/Adjustment of the Standard Tracking Preset

**NOTE :** • *When using the Jig RCU, set its custom code to match the custom code of the VCR.*

| | |
|---|---|
| Signal (A) | • Alignment tape [MHP-L] |
| Mode (B) | • PB → Auto adjust |
| Equipment (C) | • Oscilloscope |
| Measuring point (D) | • TP106 (PB. FM) [Main board] |
| External trigger (E) | • TP111 (D.FF) [Main board] |
| Adjustment part (F) | • Jig RCU: Code "50" |
| Specified value (G) | • STOP mode<br>(Maximum V.PB FM waveform) |
| Adjustment tool (H) | • Jig RCU [PTU94023B] |

(1) Play back the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E), to observe the V.PB FM waveform at the measuring point (D).
(3) Confirm that the automatic tracking operation is completed.
(4) Set the VCR to the Auto adjust mode by transmitting the code (F) twice from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(5) If the VCR enters the eject mode, perform adjustment for the audio control head phase (X-value) again.

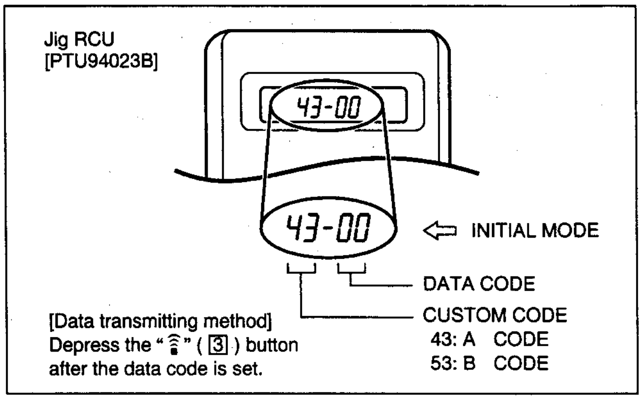

Jig RCU
[PTU94023B]
43-00
43-00
INITIAL MODE
DATA CODE
CUSTOM CODE
43: A CODE
53: B CODE
[Data transmitting method]
Depress the "⇡" ( 3 ) button
after the data code is set.

Fig. 2-3-8

### 2.3.5 Checking/Adjustment of the Tension Pole Position

| | |
|---|---|
| Signal (A) | • Back tension cassette gauge [PUJ48076-2] |
| Mode (B) | • PB |
| Adjustment part (F) | • Adjust pin [Mechansim assembly] |
| Specified value (G) | • 25 - 51 gf•cm (2.45 – 5 x $10^{-3}$ Nm] |

(1) Play back the back tension cassette gauge (A).
(2) Check that the indicated value on the left side gauge is within the specified value (G).
(3) If the indicated value is not within the specified value (G), perform the adjustment in a following procedure.
    1) Set the VCR to the mechanism service mode. (See 1.5 MECHANISM SERVICE MODE.)
    2) Set the VCR to the play back mode and adjust by turning adjustment pin to align the tension arm assembly edge with the main deck hole (A) on the right edge marker. (See Fig. 2-3-9)

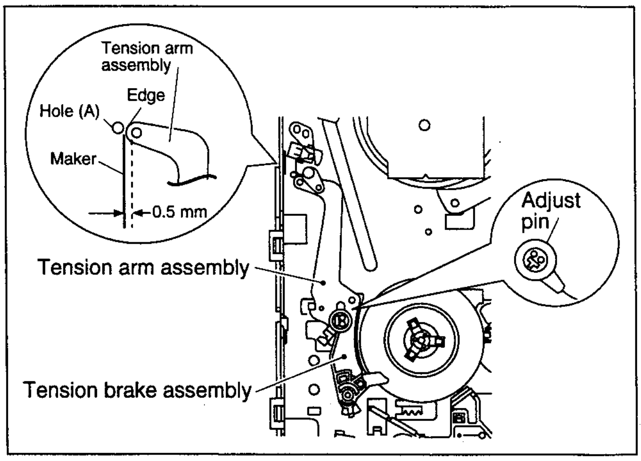
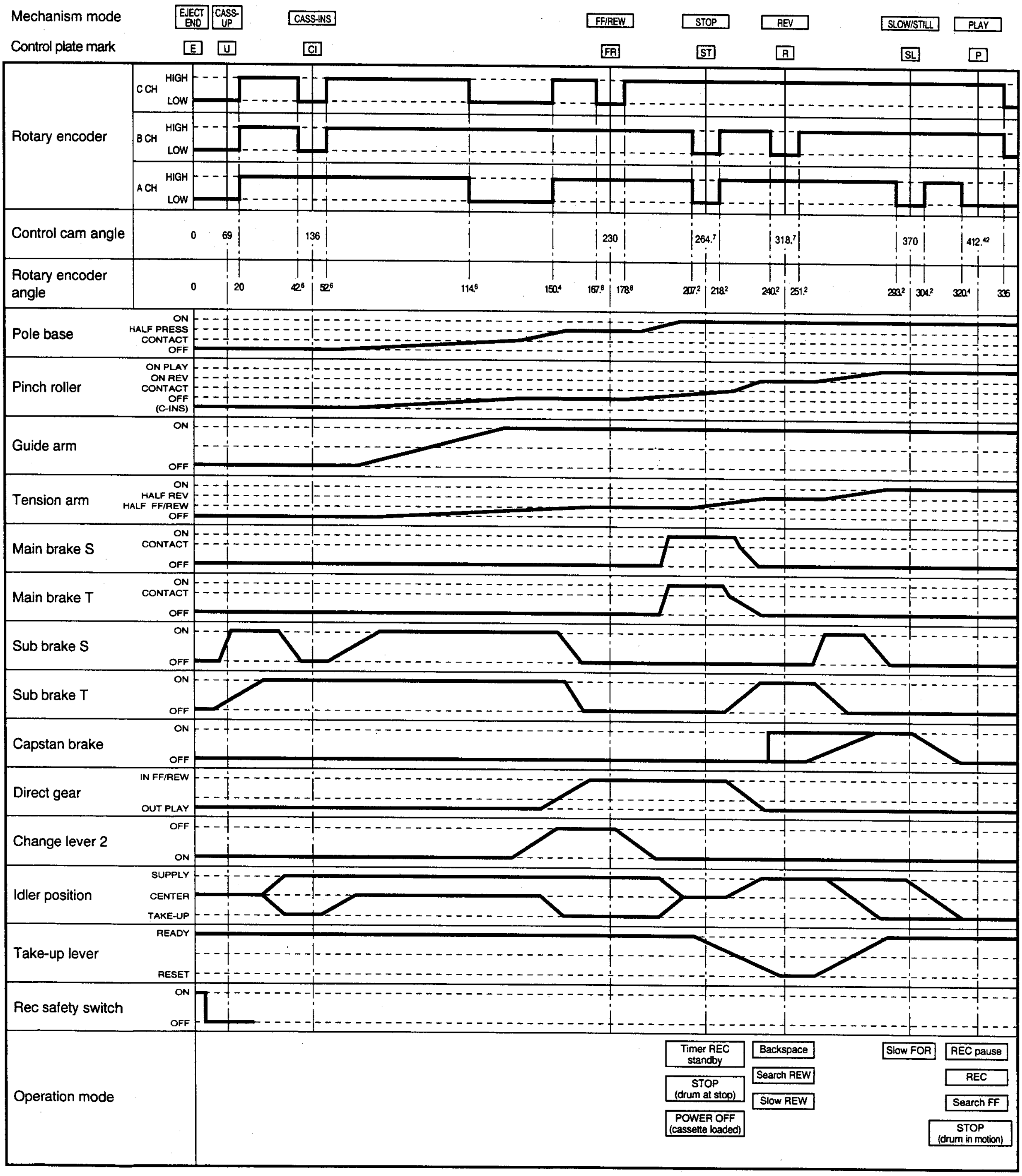

Tension arm assembly
Edge
Hole (A)
Maker
0.5 mm
Adjust pin
Tension arm assembly
Tension brake assembly

Fig. 2-3-9

## Mechanism Timing Chart



# SECTION 3
# ELECTRICAL ADJUSTMENT

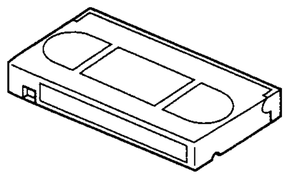
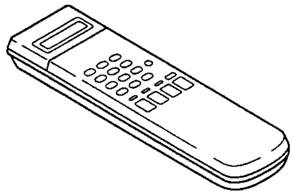
## 3.1 PRECAUTION

The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.
In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

### 3.1.1 Required test equipments

① Color television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Audio level meter
⑤ Signal generator: RF/IF sweep/marker
⑥ Signal generator: NTSC color bar, stairstep
⑦ Recording tape
⑧ Digit-key remote controller(provided)

### 3.1.2 Required adjustment tools

| Alignment tape<br>(SP,stairstep)<br>MHP | Jig RCU<br>PTU94023B |
|---|---|
|  |  |

### 3.1.3 Color bar signal,color bar pattern

- Color bar signal

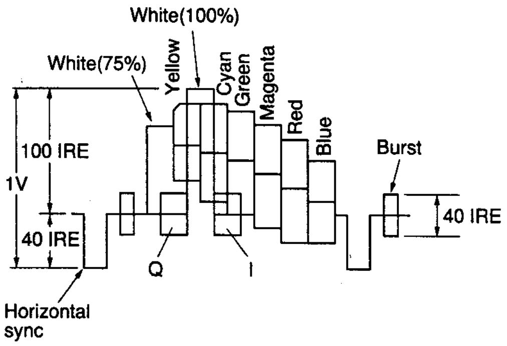

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
100 IRE
1V
40 IRE
40 IRE
Q
I
Horizontal sync

Fig. 3-1-1 Color bar signal waveform

- Color bar pattern

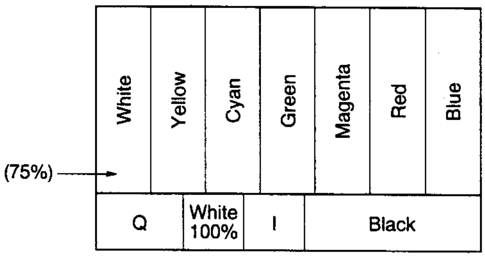

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
Q
White 100%
I
Black

Fig. 3-1-2 Color bar pattern

### 3.1.4 Switch settings and standard precautions

The SW settings of the VCR and the standard precautions for the electrical adjustments are as follows.

- *When using the Jig RCU, set its custom code to match the custom code of the VCR.*

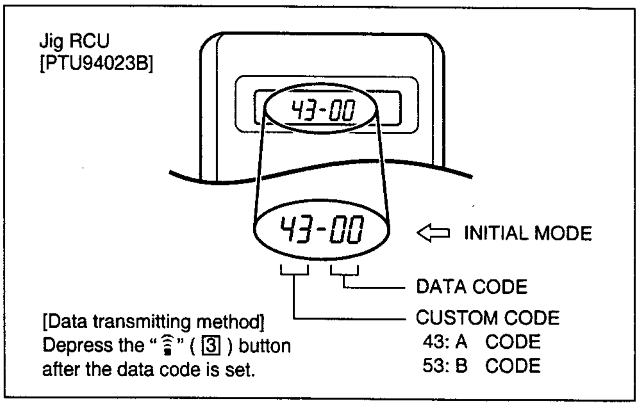

Jig RCU
[PTU94023B]
43-00
43-00
INITIAL MODE
DATA CODE
CUSTOM CODE
43: A CODE
53: B CODE
[Data transmitting method]
Depress the "⇡" (3) button
after the data code is set.

Fig. 3-1-3 Jig RCU

- *Set the switches as shown below unless otherwise specified on the relevant adjustment chart. The switches that are not listed below can be set as desired.*

| | |
|---|---|
| AUTO PICTURE (D.S.P.C.) | OFF |
| PICTURE CONTROL (SMART PICTURE) | NORMAL (NATURAL) |
| VIDEO STABILIZER | OFF |

- *Unless otherwise specified, all measuring points and adjustment parts are located on the Main board.*

### 3.1.5 EVR Adjustment

Some of the electrical adjustments require the adjustment performed by the EVR system. The Main board assembly have EEPROMs for storing the EVR adjustment data and user setups.

**Notes:**
- *In the EVR adjustment mode, the value is varied with the channel buttons (+, –). The adjusted data is stored when the setting mode changes (from PB to STOP, when the tape speed is changed, etc.). Take care to identify the current mode of each adjustment item when making an adjustment.*
- *When changing the address setting in the EVR adjustment mode, use the Jig RCU or the remote controller having numeric keypad with which a numeric code can be directly input.*
  *The remote control code of the Jig RCU corresponds to each of the digit keys on the remote controller as follows.*

| Digit-key | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Code | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |

- *As the counter indication and remaining tape indication are not displayed FDP during the EVR adjustment mode, check them on the TV monitor screen.*
- *When performing the EVR adjustment, confirm that the FDP indication is changed to the EVR mode, as shown below.*

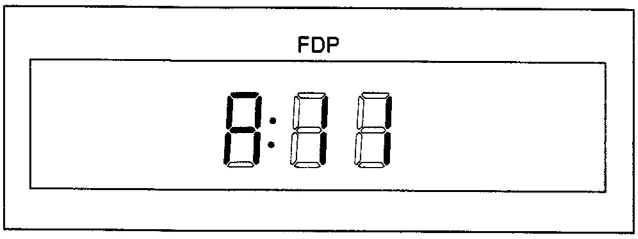


Fig. 3-1-4 EVR mode

## 3.2 SERVO CIRCUIT

### 3.2.1 Switching point

| | | |
|---|---|---|
| Signal | (A) | • Alignment tape [MHP] |
| Mode | (B) | • PB |
| Equipment | (C) | • Oscilloscope |
| Measuring point | (D1)<br>(D2) | • VIDEO OUT terminal<br>• TP106 (PB. FM) |
| External trigger | (E) | • TP111 (D.FF)/slope : – |
| Adjustment part | (F) | • Jig RCU: Code "5A" |
| Specified value | (G) | • 6.5 ± 0.5H [MHP] |
| Adjustment tool | (H) | • Jig RCU [PTU94023B] |

(1) Play back the stairstep signal of the alignment tape (A).
(2) Apply the external trigger signal to D.FF (E) to observe the VIDEO OUT waveform and V.PB FM waveform at the measuring points (D1) and (D2).
(3) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(4) Adjust tracking by pressing the channel buttons (+, –) so that the V.PB FM waveform becomes maximum.
(5) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed.
(6) Play back the alignment tape (A) again, confirm that the switching point is the specified value (G).

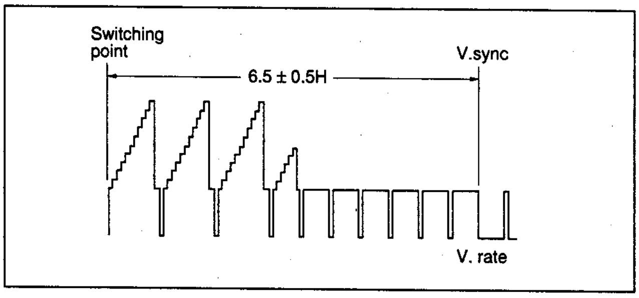


Fig. 3-2-1 Switching point

### 3.2.2 Slow tracking preset

| | | |
|---|---|---|
| Signal | (A) | • Ext. input<br>• Color bar signal |
| Mode | (B) | • REC (SP/EP) → Slow PB |
| Measuring point | (D) | • TV-Monitor |
| Adjustment part | (F) | • Jig RCU: Code "71" or "72" |
| Specified value | (G) | • Minimum noise |
| Adjustment tool | (H) | • Jig RCU [PTU94023B] |

(1) Record the color bar signal in the SP mode, and play back the recorded signal.
(2) Press the channel buttons (+, –) simultaneously to enter the manual tracking mode. (This also brings tracking to the center.)
(3) Set the VCR to the FWD slow mode.
(4) Transmit the code (F) from the Jig RCU to adjust so that the noise bar becomes the specified value (G) on the TV monitor in the slow mode.
(5) Set the VCR to the Stop mode.
(6) Confirm that the noise bar is (G) on the TV monitor in the slow mode.
(7) Repeat steps (3) to (6) in the REV slow mode.
(8) Repeat steps (1) to (7) in the EP mode.

**Note:** • *For FWD slow playback, transmit the "08" code from the Jig RCU to enter the slow playback mode, and transmit the "D0" code for REV slow mode.*

## 3.3 VIDEO CIRCUIT

### 3.3.1 AUTO PICTURE initial setting

| | | |
|---|---|---|
| Signal | (A) | • Ext. input<br>• Video: Optional |
| Mode | (B) | • EE → Auto adjust (SP/EP REC → PB) |
| Adjustment part | (F) | • Jig RCU : Code "58" |
| Specified value | (G) | • STOP mode |
| Adjustment tool | (H) | • Jig RCU [PTU94023B] |

(1) Insert the VHS cassette tape.
(2) Set the VCR to the Auto adjust mode by transmitting the code (F) from the Jig RCU. When the VCR enters the stop mode, the adjustment is completed. When the VCR enters the eject mode, repeat steps (1) to (2) again.

## 3.4 DEMODULATOR CIRCUIT

**Note:** • ***Unless otherwise specified,set an audio multiplex TV signal generator as follows;***
***RF signal : 70 dbμ / 75Ω, color bar 87.5% modulation.***

### 3.4.1 Input level

| | | |
|---|---|---|
| Signal | (A) | • RF signal (Audio: mono 300 Hz) |
| Mode | (B) | • Tuner<br>• EE |
| Equipment | (C) | • Audio level meter |
| Measuring point | (D) | • IC6501 pin 26 |
| EVR mode<br>EVR address | (F1)<br>(F2) | • Jig RCU : Code "57"<br>• A : 20 (Press remote controller "2" and "0" keys.) |
| Specified value | (G) | • 500 ± 10 mVrms |
| Adjustment tool | (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Set an audio signal mode of the RF signal generator to mono 300 Hz.
(2) Connect the equipment (C) to the measuring point (D).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the level of the measuring point (D) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

### 3.4.2 Stereo VCO

| | | |
|---|---|---|
| Signal | (A) | • No signal |
| Mode | (B) | • Tuner<br>• EE |
| Equipment | (C) | • Frequency counter |
| Measuring point<br>Short point | (D1)<br>(D2) | • IC6501 pin 26<br>• C6505(–) terminal |
| EVR mode<br>EVR address | (F1)<br>(F2) | • Jig RCU : Code "57"<br>• A : 21 (Press remote controller "2" and "1" keys.) |
| Specified value | (G) | • 15.73 ± 0.1 kHz |
| Adjustment tool | (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Connect the short wire between the short point (D2) and the GND (Ground).
(2) Connect the equipment (C) to the measuring point (D1).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the frequency of the measuring point (D1) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)
(7) Disconnect the short wire between the short point (D2) and the GND (Ground).

### 3.4.3 Stereo filter

| | | |
|---|---|---|
| Signal | (A) | • RF signal (Audio: No signal) |
| Mode | (B) | • Tuner<br>• EE |
| Equipment | (C) | • Oscilloscope |
| Measuring point | (D) | • IC6501 pin 26 |
| EVR mode<br>EVR address | (F1)<br>(F2) | • Jig RCU : Code "57"<br>• A : 22 (Press remote controller "2" key twice.) |
| Specified value | (G) | • Minimum level |
| Adjustment tool | (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Set an audio signal mode of the RF signal generator to no signal.
(2) Connect the equipment (C) to the measuring point (D).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the level of the measuring point (D) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

### 3.4.4 Separation - 1

| | |
|---|---|
| Signal (A) | • RF signal<br>(Audio: L-ch 300 Hz 14% modulated) |
| Mode (B) | • Tuner<br>• EE |
| Equipment (C) | • Audio level meter |
| Measuring point (D) | • IC6501 pin 26 |
| EVR mode (F1)<br>EVR address (F2) | • Jig RCU : Code "57"<br>• A : 23 (Press remote controller "2" and "3" keys.) |
| Specified value (G) | • Minimum level |
| Adjustment tool (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Set an audio signal mode of the RF signal generator to alternate L-ch 300 Hz 14% modulated.
(2) Connect the equipment (C) to the measuring point (D).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the level of the measuring point (D) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

### 3.4.5 Separation - 2

| | |
|---|---|
| Signal (A) | • RF signal<br>(Audio: L-ch 5 kHz 14% modulated) |
| Mode (B) | • Tuner<br>• EE |
| Equipment (C) | • Audio level meter |
| Measuring point (D) | • IC6501 pin 26 |
| EVR mode (F1)<br>EVR address (F2) | • Jig RCU : Code "57"<br>• A : 24 (Press remote controller "2" and "4" keys.) |
| Specified value (G) | • Minimum level |
| Adjustment tool (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Set an audio signal mode of the RF signal generator to alternate L-ch 5 kHz 14% modulated.
(2) Connect the equipment (C) to the measuring point (D).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the level of the measuring point(D) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

### 3.4.6 SAP VCO

| | |
|---|---|
| Signal (A) | • No. signal |
| Mode (B) | • Tuner<br>• EE |
| Equipment (C) | • Frequency counter |
| Measuring point (D1)<br>Short point (D2) | • IC6501 pin 26<br>• C6505 (–) terminal |
| EVR mode (F1)<br>EVR address (F2) | • Jig RCU : Code "57"<br>• A : 25 (Press remote controller "2" and "5" keys.) |
| Specified value (G) | • 78.67 ± 0.5 kHz |
| Adjustment tool (H) | • Jig RCU [PTU94023B]<br>• Digit-key remote controller |

(1) Connect the short wire between the short point (D2) and the GND (Ground).
(2) Connect the equipment (C) to the measuring point (D1).
(3) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU for more than 2 seconds.
(4) Set the EVR address to (F2) by pressing the button of the digit-key remote controller.
(5) Adjust with the channel buttons (+,–) on the VCR (or on the remote controller) so that the frequency of the measuring point (D1) becomes the specified value (G).
(6) Release the EVR mode of the VCR by transmitting the code (F1) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)
(7) Disconnect the short wire between the short point (D2) and the GND (Ground).

# SECTION 4
# CHARTS AND DIAGRAMS

## NOTES OF SCHEMATIC DIAGRAM

**Safety precautions**
**The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.**

### 1. Units of components on the schematic diagram

Unless otherwise specified.

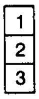
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in µF, (P: PF).
3) All inductance values are in µH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

### 2. Indications of control voltage

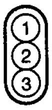
AUX : Active at high

$\overline{\text{AUX}}$ or AUX(L) : Active at low

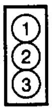
### 3. Interpreting Connector indications



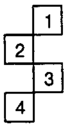
Removable connector



Wire soldered directly on board



Non-removable Board connector

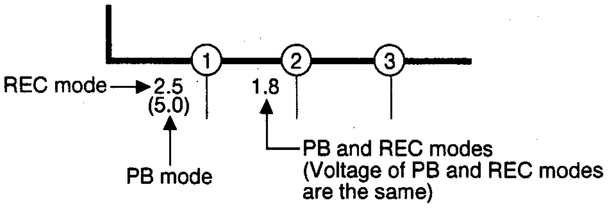


Board to Board

→
←
↔ Connected pattern on board
The arrows indicate signal path

### 4. Voltage measurement

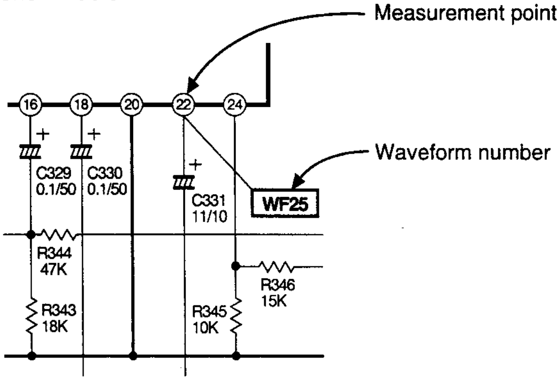
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


1
2
3
REC mode
2.5
(5.0)
1.8
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

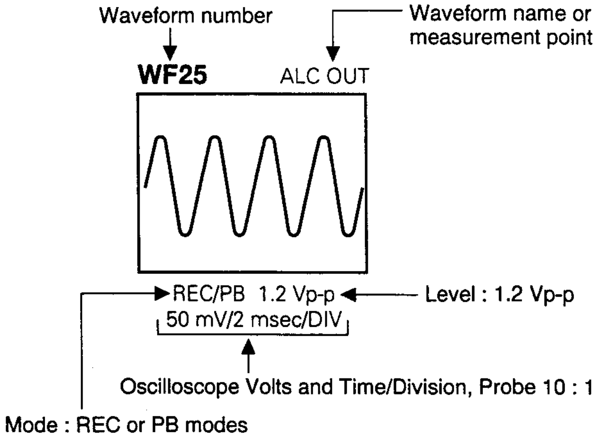
**Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.**

### 5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.


Measurement point
16
18
20
22
24
Waveform number
C329 0.1/50
C330 0.1/50
C331 11/10
WF25
R344 47K
R343 18K
R345 10K
R346 15K

5) Waveform indications


Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
50 mV/2 msec/DIV
Level : 1.2 Vp-p
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

## 6. Signal path Symbols

The arrows indicate the signal path as follows.

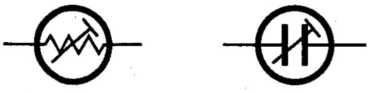
- ⇨ Playback signal path
- ➡ Playback and recording signal path
- ➡ Recording signal path (including E-E signal path)
- ⇨▷ Capstan servo path
- ➡▶ Drum servo path

(Example)

- ⇨ R-Y Playback R-Y signal path
- ➡ Y Recording Y signal path

## 7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



## 8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

# CIRCUIT BOARD NOTES

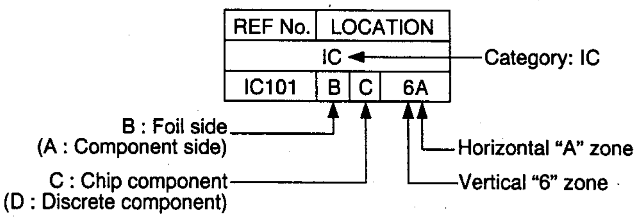
## 1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.

2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

## 2. Parts location guides

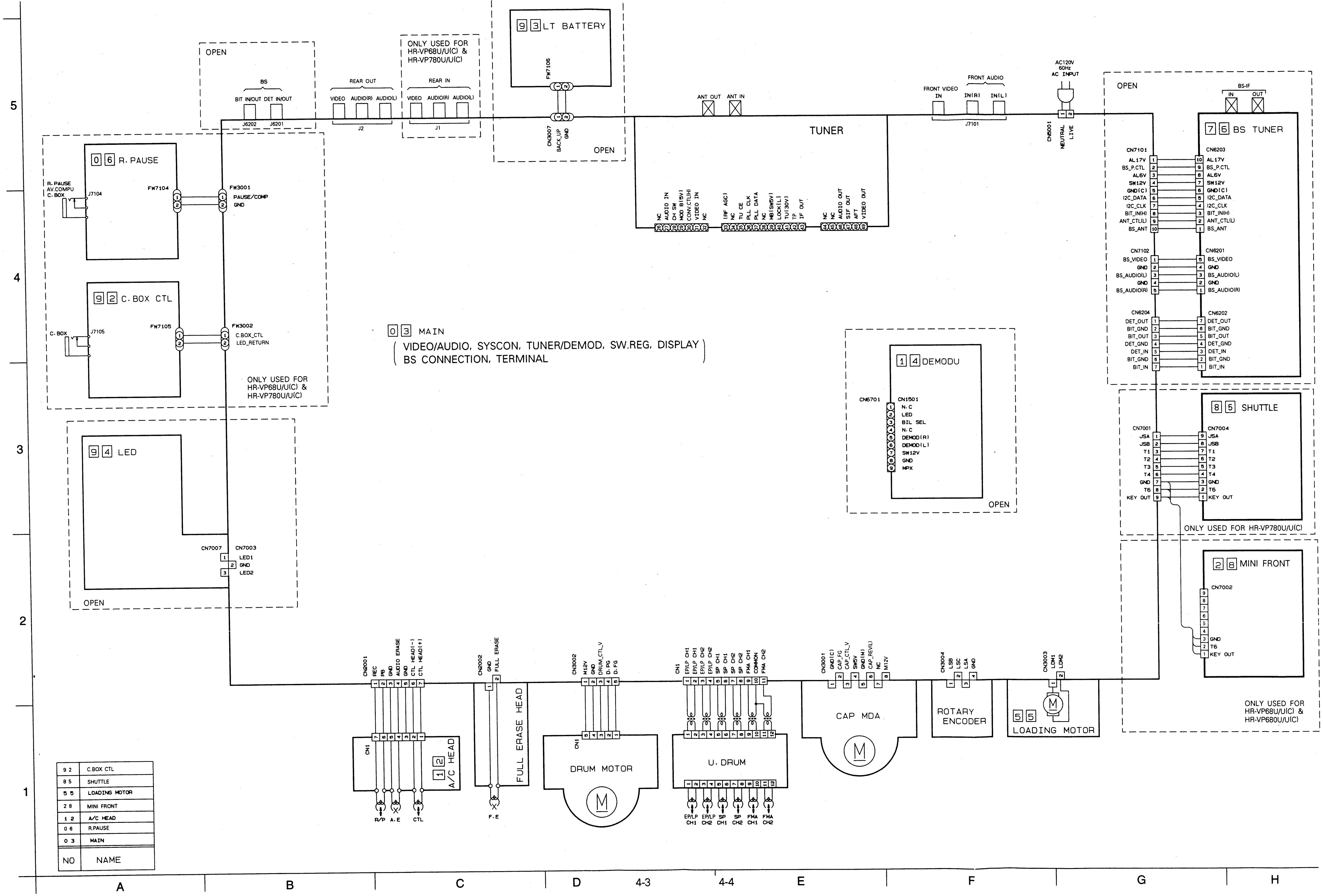
Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category: IC
IC101
B
C
6A
B : Foil side
(A : Component side)
C : Chip component
(D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

**Note:**

**For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).**

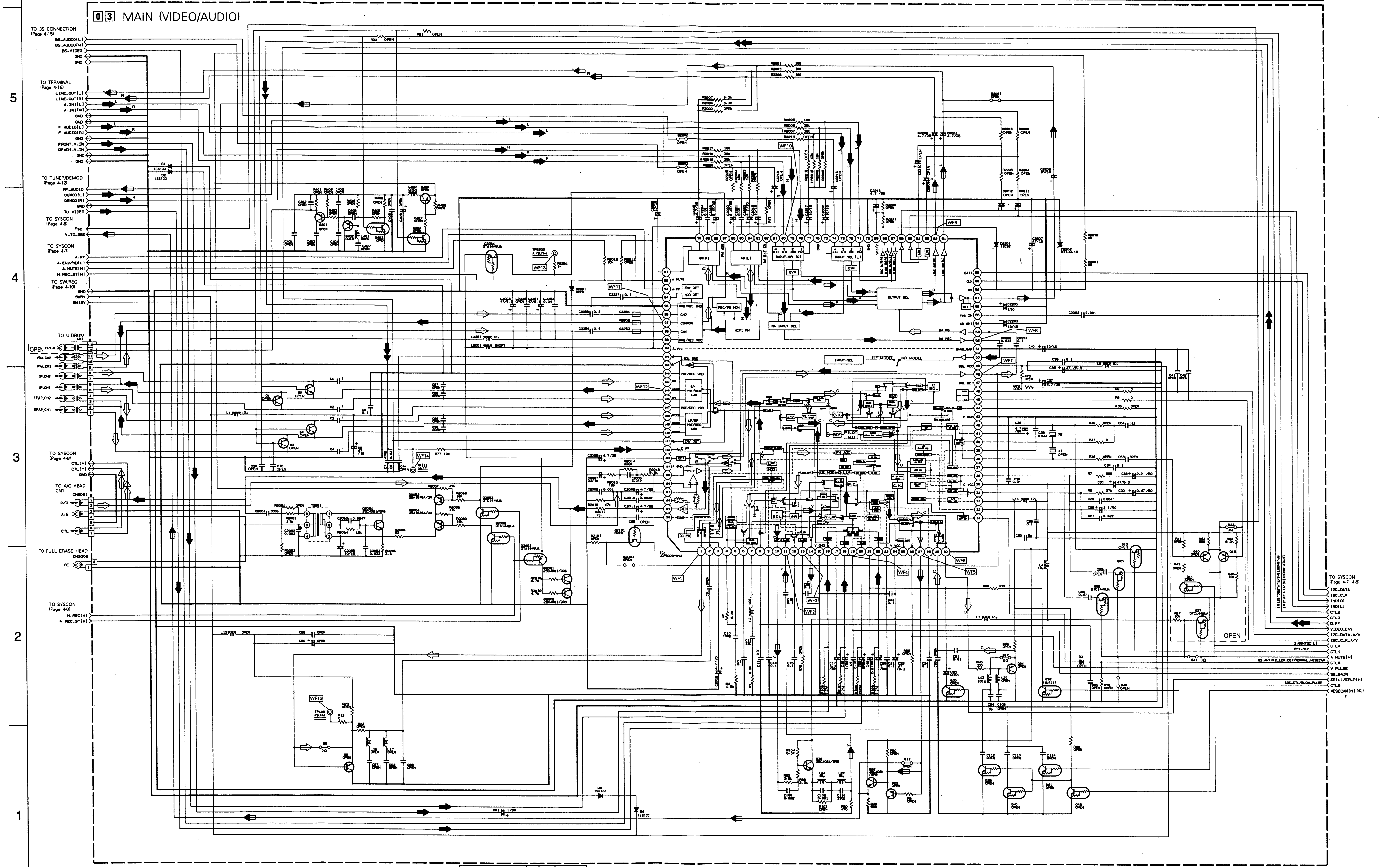
## 4.1 BOARD INTERCONNECTIONS


OPEN
BS
BIT IN/OUT DET IN/OUT
J6202 J6201
REAR OUT
VIDEO AUDIO(R) AUDIO(L)
J2
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
REAR IN
VIDEO AUDIO(R) AUDIO(L)
J1
93 LT BATTERY
FW7106
CN3007
BACK_UP
GND
OPEN
ANT OUT ANT IN
TUNER
NC AUDIO IN CH SW MOD B(5V) CONV.CTL(H) VIDEO IN NC
(RF AGC) NC TU CE PLL CLK PLL DATA NC MB(SW5V) LOCK(L) TU(30V) TP IF OUT
NC NC AUDIO OUT SIF OUT AFT VIDEO OUT
FRONT VIDEO IN
FRONT AUDIO
IN(R) IN(L)
J7101
AC120V 60Hz AC INPUT
CN5001
NEUTRAL
LIVE
06 R. PAUSE
R. PAUSE
AV.COMPU
C. BOX
J7104
FW7104
FW3001
PAUSE/COMP
GND
92 C. BOX CTL
C. BOX
J7105
FW7105
FW3002
C.BOX_CTL
LED_RETURN
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
94 LED
CN7007
CN7003
LED1
GND
LED2
OPEN
03 MAIN
VIDEO/AUDIO, SYSCON, TUNER/DEMOD, SW.REG, DISPLAY
BS CONNECTION, TERMINAL
14 DEMODU
CN6701
CN1501
N.C
LED
BIL SEL
N.C
DEMOD(R)
DEMOD(L)
SW12V
GND
MPX
OPEN
OPEN
BS-IF
IN OUT
76 BS TUNER
CN7101
AL17V
BS_P.CTL
AL6V
SW12V
GND(C)
I2C_DATA
I2C_CLK
BIT_IN(H)
ANT_CTL(L)
BS_ANT
CN6203
CN7102
BS_VIDEO
GND
BS_AUDIO(L)
GND
BS_AUDIO(R)
CN6201
CN6204
DET_OUT
BIT_GND
BIT_OUT
DET_GND
DET_IN
BIT_GND
BIT_IN
CN6202
85 SHUTTLE
CN7001
CN7004
JSA
JSB
T1
T2
T3
T4
GND
T6
KEY OUT
ONLY USED FOR HR-VP780U/U(C)
28 MINI FRONT
CN7002
GND
T6
KEY OUT
ONLY USED FOR HR-VP68U/U(C) & HR-VP680U/U(C)
CN2001
REC
PB
GND
AUDIO ERASE
GND
CTL HEAD(-)
CTL HEAD(+)
CN1
12 A/C HEAD
R/P A.E CTL
CN2002
GND
FULL ERASE
FULL ERASE HEAD
F.E
CN3002
M12V
GND
DRUM_CTL_V
D.PG
D.FG
CN1
DRUM MOTOR
M
CN1
EP/LP CH1
EP/LP CH1
EP/LP CH2
EP/LP CH2
SP CH1
SP CH1
SP CH2
SP CH2
FMA CH1
COMMON
FMA CH2
U. DRUM
EP/LP CH1 EP/LP CH2 SP CH1 SP CH2 FMA CH1 FMA CH2
CN3001
GND(C)
CAP_FG
CAP_CTL_V
SW5V
GND(M)
CAP_REV(L)
NC
M12V
CAP MDA
M
CN3004
LSB
LSC
LSA
GND
ROTARY ENCODER
CN3003
LDM1
LDM2
55 LOADING MOTOR
M
1 2 3 4 5
A B C D E F G H

| NO | NAME |
|---|---|
| 9 2 | C.BOX CTL |
| 8 5 | SHUTTLE |
| 5 5 | LOADING MOTOR |
| 2 8 | MINI FRONT |
| 1 2 | A/C HEAD |
| 0 6 | R.PAUSE |
| 0 3 | MAIN |

## 4.2 VIDEO/AUDIO SCHEMATIC DIAGRAM

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*


0 3 MAIN (VIDEO/AUDIO)
TO BS CONNECTION (Page 4-15)
BS_AUDIO(L)
BS_AUDIO(R)
BS_VIDEO
GND
GND
TO TERMINAL (Page 4-16)
LINE_OUT(L)
LINE_OUT(R)
A.IN1(L)
A.IN1(R)
GND
GND
F.AUDIO(L)
F.AUDIO(R)
GND
FRONT_V_IN
REAR1_V_IN
GND
GND
TO TUNER/DEMOD (Page 4-12)
RF_AUDIO
DEMOD(L)
DEMOD(R)
GND
TU_VIDEO
TO SYSCON (Page 4-8)
Fsc
V_TO_OSD
TO SYSCON (Page 4-7)
A.FF
A.ENV/ND(L)
A.MUTE(H)
H.REC_ST(H)
TO SW.REG (Page 4-10)
GND
SW5V
SW12V
TO U.DRUM
CN1
OPEN
FLY.E
FM.CH2
FM.CH1
SP.CH2
SP.CH1
EP/LP_CH2
EP/LP_CH1
TO SYSCON (Page 4-8)
CTL(+)
CTL(-)
GND
TO A/C HEAD CN1
CN2001
P/R
A.E
CTL
TO FULL ERASE HEAD
CN2002
FE
TO SYSCON (Page 4-8)
N.REC(H)
N.REC_ST(H)
TO SYSCON (Page 4-7, 4-8)
I2C_DATA
I2C_CLK
IND(R)
IND(L)
CTL2
CTL3
D.FF
VIDEO_ENV
I2C_DATA_A/V
I2C_CLK_A/V
CTL4
CTL1
A.MUTE(H)
CTL8
V.PULSE
SB_GAIN
EE(L)/EPLP(H)
CTL5
MESECAM(H)(NC)
3.58NTSC(L)
R-Y_REV
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
WF15
OPEN
IC1
5
4
3
2
1
A
B
C
D
E
F
G
H

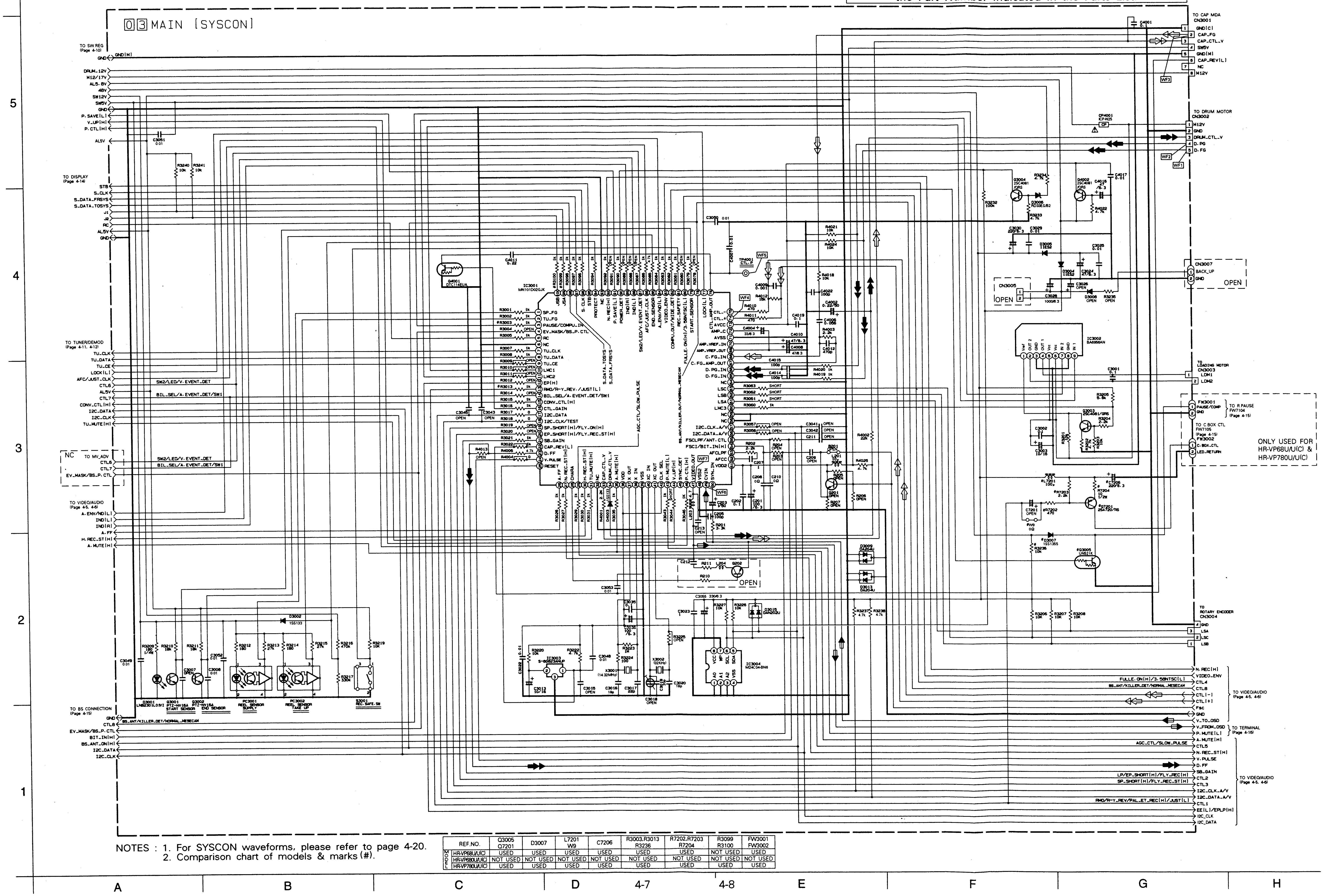
NOTES : 1. For VIDEO/AUDIO waveforms, please refer to page 4-20.

2. Comparison chart of models & marks (#).

| REF.NO. | | R107.R2007<br>R2010.R2219.R2224 |
|---|---|---|
| MODEL | HR-VP68U/U(C)<br>HR-VP780U/U(C) | USED |
| | HR-VP680U/U(C) | NOT USED |

## 4.3 SYSTEM CONTROL SCHEMATIC DIAGRAM

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*



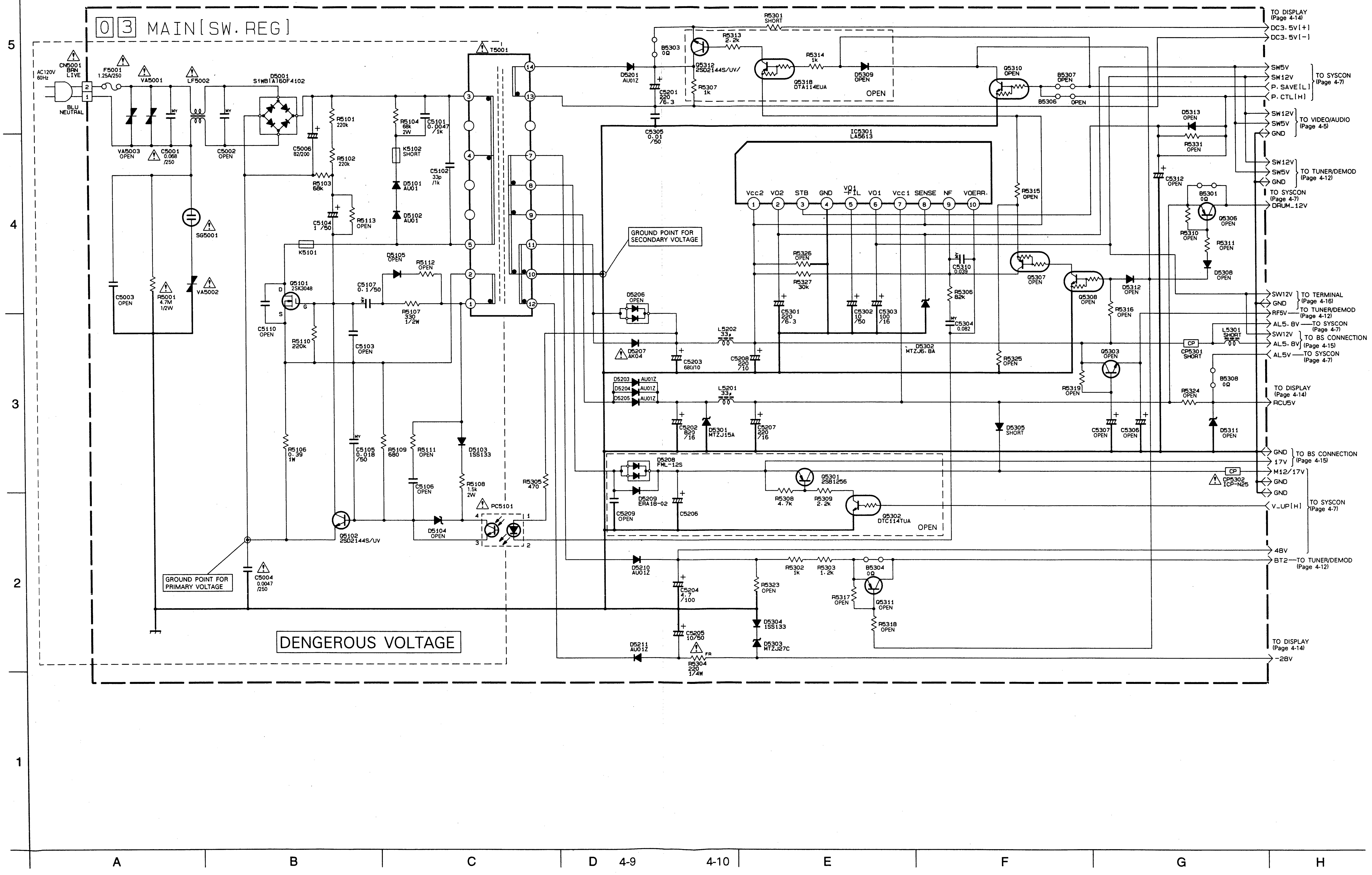
03 MAIN [SYSCON]
TO SW REG (Page 4-10)
GND
DRUM_12V
M12/17V
AL5.8V
48V
SW12V
SW5V
GND
P.SAVE[L]
V_UP[H]
P.CTL[H]
AL5V
TO DISPLAY (Page 4-14)
STB
S_CLK
S_DATA_FRSYS
S_DATA_TOSYS
J1
J2
RC
AL5V
GND
TO TUNER/DEMOD (Page 4-11, 4-12)
TU_CLK
TU_DATA
TU_CE
LOCK[L]
AFC/JUST_CLK
CTL6
AL5V
CTL7
CONV_CTL[H]
I2C_DATA
I2C_CLK
TU_MUTE[H]
NC
TO MV_ADV
CTL6
CTL7
EV_MASK/BS_P.CTL
SW2/LED/V.EVENT_DET
BIL_SEL/A.EVENT_DET/SW1
TO VIDEO/AUDIO (Page 4-5, 4-6)
A.ENV/ND[L]
IND[L]
IND[R]
A.FF
H.REC_ST[H]
A.MUTE[H]
TO BS CONNECTION (Page 4-15)
GND
CTL8
EV_MASK/BS_P.CTL
BIT_IN[H]
BS_ANT_ON[H]
I2C_DATA
I2C_CLK
BS_ANT/KILLER_DET/NORMAL_MESECAM
IC3001 MN101D02GJK
Q4001 DTC114EUA
IC3002 BA6956AN
IC3003 S-80823ANUP
IC3004 M24C04-BN6
X3001 (14.32MHz)
X3002 (32KHz)
D3001 LN8230(LO9V) START SENSOR
Q3001 PTZ-NV16A
Q3002 PTZ-NV16A END SENSOR
PC3001 REEL SENSOR SUPPLY
PC3002 REEL SENSOR TAKE UP
S3001 REC. SAFE. SW
D3002 1SS133
CN3005 OPEN
CN3007 BACK_UP GND OPEN
TO CAP MDA CN3001
GND[C]
CAP_FG
CAP_CTL_V
SW5V
GND[H]
CAP_REV[L]
NC
M12V
TO DRUM MOTOR CN3002
M12V
GND
DRUM_CTL_V
D.PG
D.FG
CP4001 ICP-N25
WF1
WF2
WF3
WF4
WF5
WF6
WF7
TP4001 CTL.P
TO LOADING MOTOR CN3003
LDM1
LDM2
FW3001 PAUSE/COMP GND
TO R.PAUSE FW7104 (Page 4-15)
TO C.BOX CTL FW7105 (Page 4-15)
FW3002 C.BOX_CTL LED_RETURN
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
TO ROTARY ENCODER CN3004
GND
LSA
LSC
LSB
N.REC[H]
VIDEO_ENV
FULLE.ON[H]/3.58NTSC[L]
CTL4
CTL8
CTL[-]
CTL[+]
Fsc
GND
V_TO_OSD
V_FROM_OSD
P.MUTE[L]
A.MUTE[H]
AGC_CTL/SLOW_PULSE
CTL5
N.REC_ST[H]
V.PULSE
D.FF
SB_GAIN
LP/EP_SHORT[H]/FLY_REC[H]
CTL2
SP_SHORT[H]/FLY_REC_ST[H]
CTL3
I2C_CLK_A/V
I2C_DATA_A/V
RMO/R-Y_REV/PAL_ET_REC[H]/JUST[L]
CTL1
EE[L]/EPLP[H]
I2C_CLK
I2C_DATA
TO VIDEO/AUDIO (Page 4-5, 4-6)
TO TERMINAL (Page 4-16)
OPEN
A
B
C
D
E
F
G
H
1
2
3
4
5

NOTES : 1. For SYSCON waveforms, please refer to page 4-20.
2. Comparison chart of models & marks (#).

| | REF.NO. | Q3005<br>Q7201 | D3007 | L7201<br>W9 | C7206 | R3003,R3013<br>R3236 | R7202,R7203<br>R7204 | R3099<br>R3100 | FW3001<br>FW3002 |
|---|---|---|---|---|---|---|---|---|---|
| MODEL | HR-VP68U/U(C) | USED | USED | USED | USED | USED | USED | NOT USED | USED |
| | HR-VP680U/U(C) | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED |
| | HR-VP780U/U(C) | USED | USED | USED | USED | USED | USED | USED | USED |

## 4.4 SWITCHING REGULATOR SCHEMATIC DIAGRAM

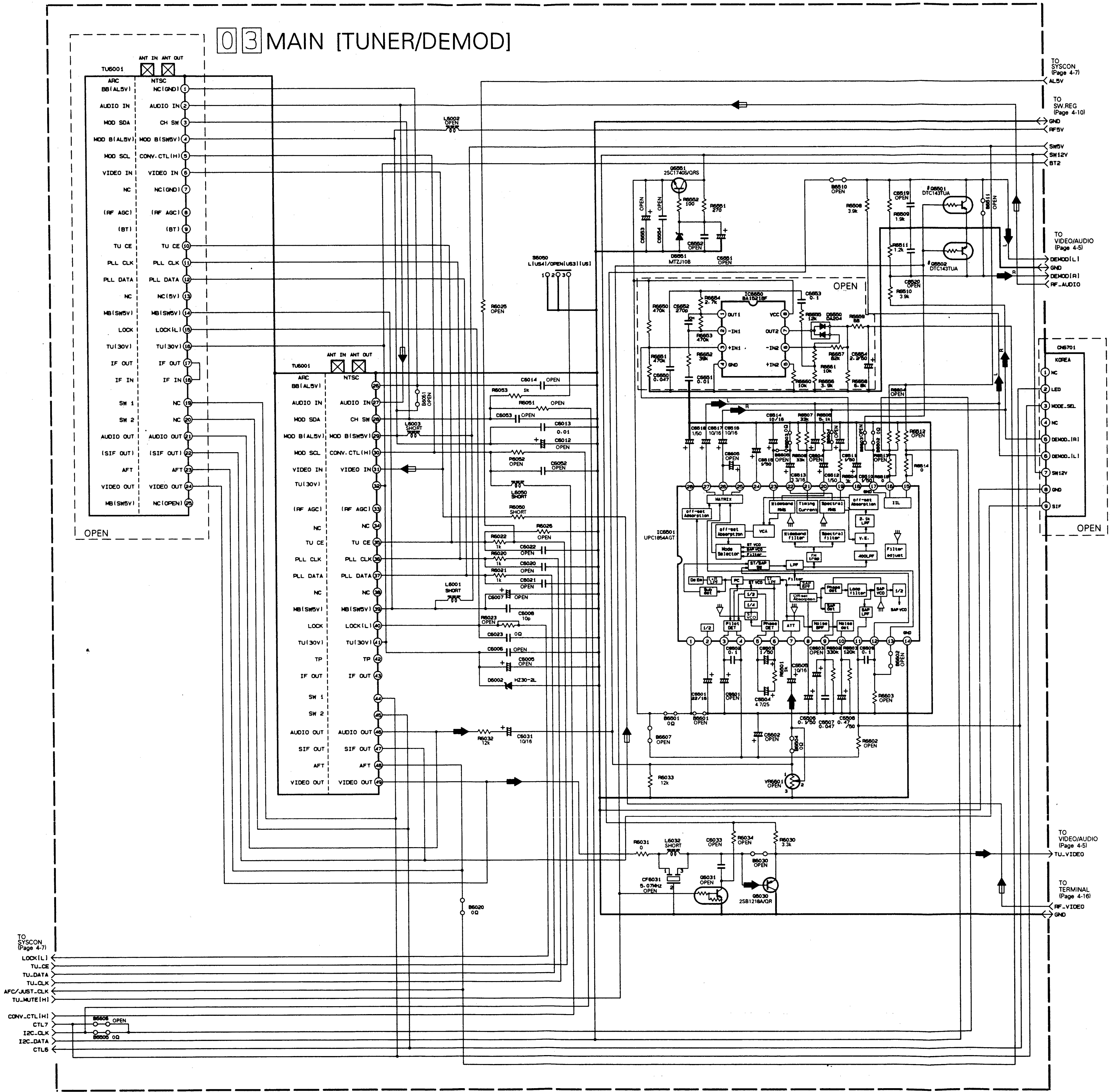
*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*



03 MAIN[SW. REG]
DENGEROUS VOLTAGE
GROUND POINT FOR PRIMARY VOLTAGE
GROUND POINT FOR SECONDARY VOLTAGE
AC120V 60Hz
CN5001
BRN LIVE
BLU NEUTRAL
F5001 1.25A/250
VA5001
LF5002
D5001 S1WB(A)60F4102
VA5003 OPEN
C5001 0.068 /250
C5002 OPEN
SG5001
C5003 OPEN
R5001 4.7M 1/2W
VA5002
C5006 82/200
R5101 220k
R5102 220k
R5103 68k
C5104 1/50
R5113 OPEN
R5104 68k 2W
C5101 0.0047 /1k
K5102 SHORT
D5101 AU01
D5102 AU01
C5102 33p /1k
K5101
Q5101 2SK3048
C5110 OPEN
R5110 220k
D5105 OPEN
R5112 OPEN
C5107 0.1/50
R5107 330 1/2W
C5103 OPEN
R5106 0.39 1W
C5105 0.018 /50
R5109 680
R5111 OPEN
D5103 1SS133
C5106 OPEN
R5108 1.5k 2W
Q5102 2SD2144S/UV
D5104 OPEN
PC5101
R5305 470
C5004 0.0047 /250
T5001
D5201 AU01Z
R5301 SHORT
B5303 0Ω
C5201 220 /6.3
C5305 0.01 /50
Q5312 2SD2144S/UV/
R5313 2.2k
R5307 1k
Q5318 DTA114EUA
R5314 1k
D5309 OPEN
OPEN
Q5310 OPEN
B5307 OPEN
B5306 OPEN
IC5301 LA5613
Vcc2 VO2 STB GND VO1 -FIL VO1 Vcc1 SENSE NF VOERR.
R5315 OPEN
D5206 OPEN
D5207 AK04
C5203 680/10
L5202 33μ
C5208 220 /10
R5326 OPEN
R5327 30k
C5301 220 /6.3
C5302 10 /50
C5303 100 /16
D5302 MTZJ6.8A
C5310 0.039
R5306 82k
C5304 0.082
Q5307 OPEN
Q5308 OPEN
D5312 OPEN
R5316 OPEN
R5325 OPEN
D5313 OPEN
R5331 OPEN
C5312 OPEN
B5301 0Ω
Q5306 OPEN
R5310 OPEN
R5311 OPEN
D5308 OPEN
D5203 AU01Z
D5204 AU01Z
D5205 AU01Z
L5201 33μ
C5202 820 /16
D5301 MTZJ15A
C5207 220 /16
D5305 SHORT
Q5303 OPEN
R5319 OPEN
C5307 OPEN
C5306 OPEN
R5324 OPEN
B5308 0Ω
D5311 OPEN
CP5301 SHORT
L5301 SHORT
D5208 FML-12S
D5209 ERA18-02
C5209 OPEN
C5206
Q5301 2SB1256
R5308 4.7k
R5309 2.2k
Q5302 DTC114TUA
OPEN
CP5302 ICP-N25
D5210 AU01Z
C5204 4.7 /100
R5323 OPEN
R5302 1k
R5303 1.2k
B5304 0Ω
R5317 OPEN
Q5311 OPEN
R5318 OPEN
D5304 1SS133
D5303 MTZJ27C
C5205 10/50
D5211 AU01Z
R5304 220 1/4W
TO DISPLAY (Page 4-14)
DC3.5V[+]
DC3.5V[-]
SW5V
SW12V
P.SAVE[L]
P.CTL[H]
TO SYSCON (Page 4-7)
SW12V
SW5V
GND
TO VIDEO/AUDIO (Page 4-5)
SW12V
SW5V
GND
TO TUNER/DEMOD (Page 4-12)
TO SYSCON (Page 4-7)
DRUM_12V
SW12V
GND
TO TERMINAL (Page 4-16)
RF5V
TO TUNER/DEMOD (Page 4-12)
AL5.8V
TO SYSCON (Page 4-7)
SW12V
AL5.8V
TO BS CONNECTION (Page 4-15)
AL5V
TO SYSCON (Page 4-7)
TO DISPLAY (Page 4-14)
RCU5V
GND
17V
TO BS CONNECTION (Page 4-15)
M12/17V
GND
GND
V_UP[H]
TO SYSCON (Page 4-7)
48V
BT2
TO TUNER/DEMOD (Page 4-12)
TO DISPLAY (Page 4-14)
-28V
5
4
3
2
1
A
B
C
D
E
F
G
H

## 4.5 TUNER/DEMOD SCHEMATIC DIAGRAM

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*

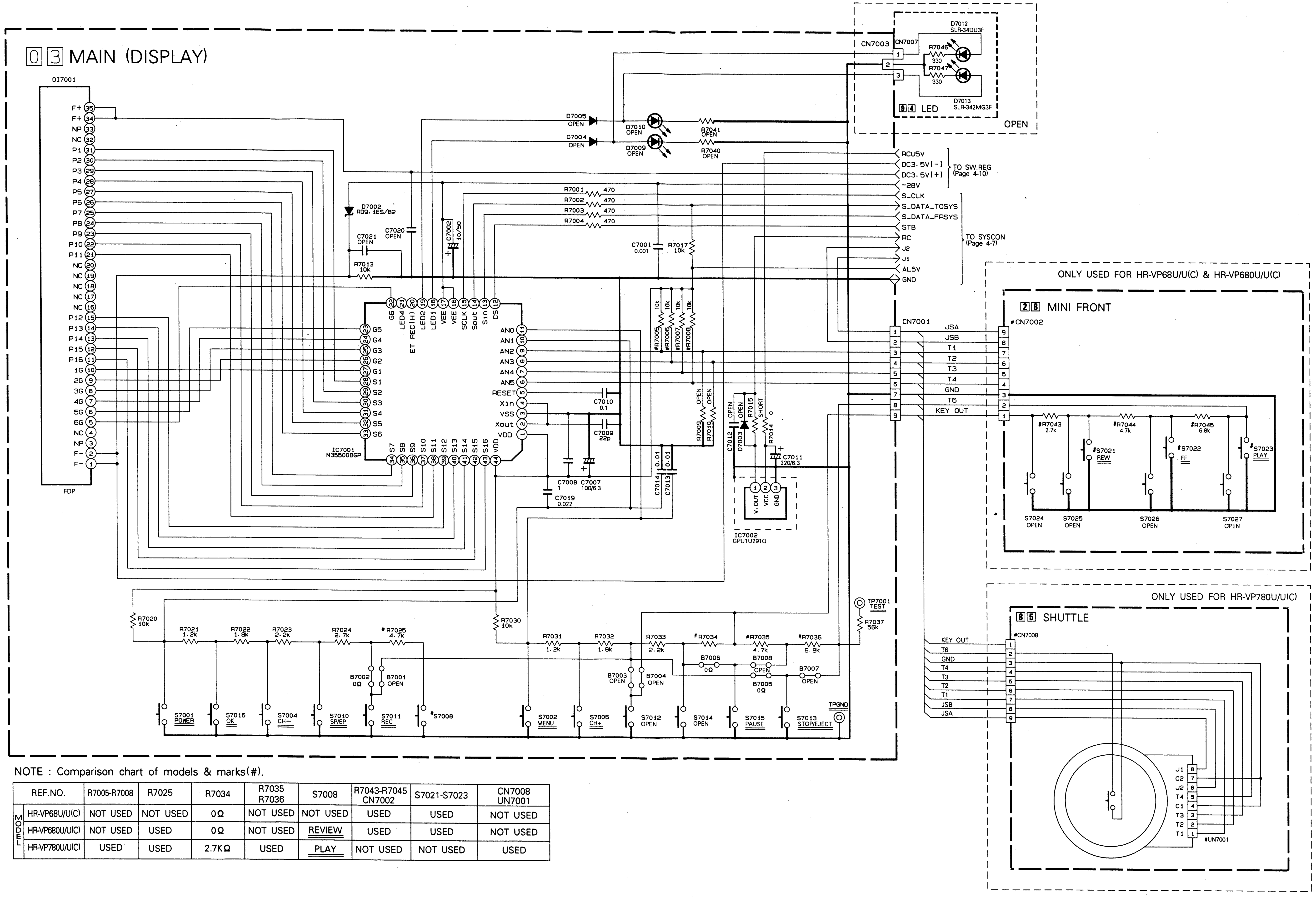

03 MAIN [TUNER/DEMOD]
TU6001
ANT IN
ANT OUT
ARC
NTSC
OPEN
IC6601
UPC1854AGT
IC6650
CN6701
KOREA
TO SYSCON (Page 4-7)
AL5V
TO SW.REG (Page 4-10)
GND
RF5V
SW5V
SW12V
BT2
TO VIDEO/AUDIO (Page 4-5)
DEMOD(L)
GND
DEMOD(R)
RF_AUDIO
TO VIDEO/AUDIO (Page 4-5)
TU_VIDEO
TO TERMINAL (Page 4-16)
RF_VIDEO
GND
TO SYSCON (Page 4-7)
LOCK(L)
TU_CE
TU_DATA
TU_CLK
AFC/JUST_CLK
TU_MUTE(H)
CONV_CTL(H)
CTL7
I2C_CLK
I2C_DATA
CTL6
B6606 OPEN
B6605 0Ω
5
4
3
2
1

NOTE : Comparison chart of models & marks(#).

| | REF.NO. | Q6501<br>Q6502 |
|---|---|---|
| MODEL | HR-VP68U/U(C) | NOT USED |
| | HR-VP680U/U(C) | NOT USED |
| | HR-VP780U/U(C) | USED |

## 4.6 DISPLAY, MINI FRONT AND SHUTTLE SCHEMATIC DIAGRAMS

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*

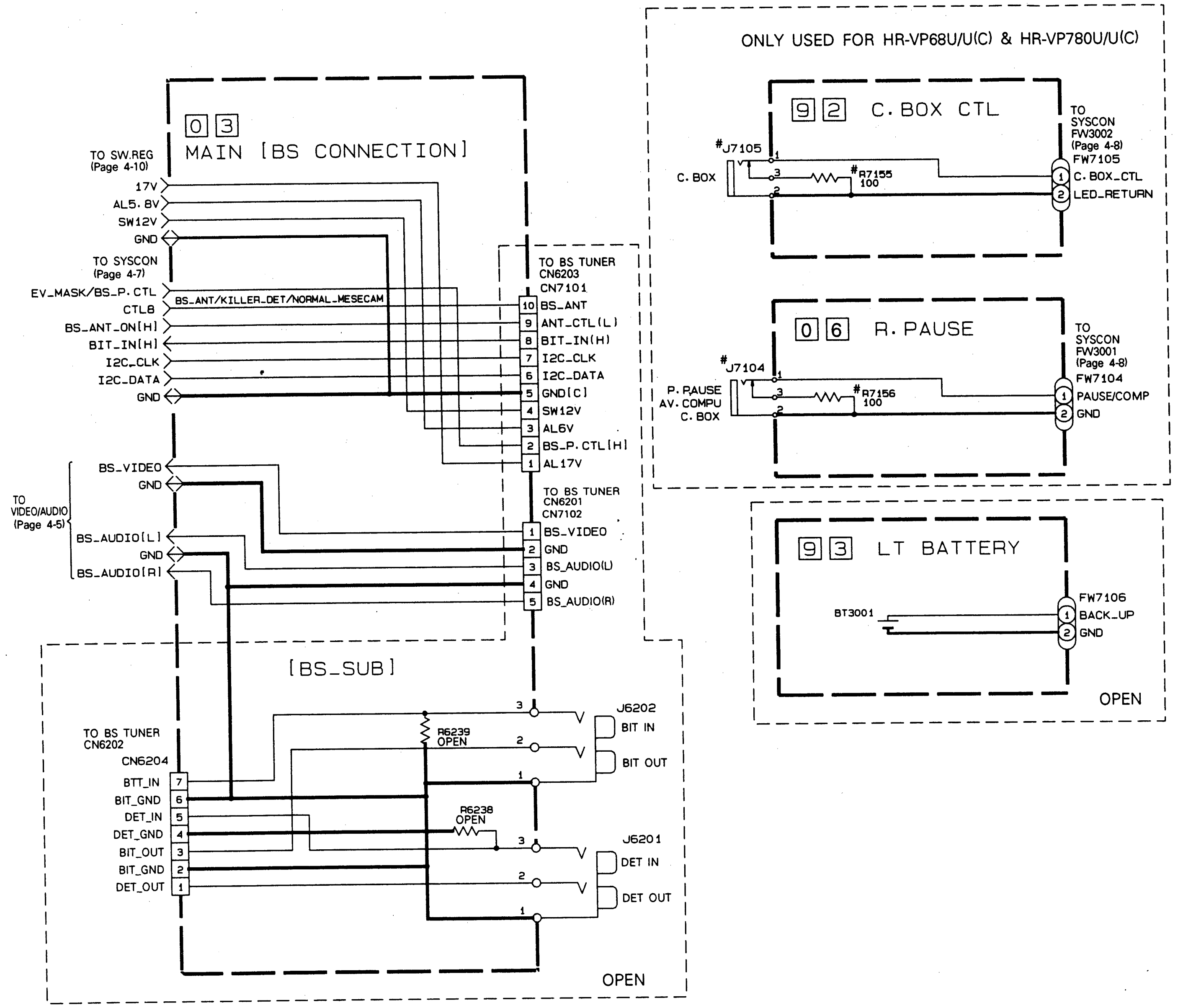

03 MAIN (DISPLAY)
DI7001
F+ 35
F+ 34
NP 33
NC 32
P1 31
P2 30
P3 29
P4 28
P5 27
P6 26
P7 25
P8 24
P9 23
P10 22
P11 21
NC 20
NC 19
NC 18
NC 17
NC 16
P12 15
P13 14
P14 13
P15 12
P16 11
1G 10
2G 9
3G 8
4G 7
5G 6
6G 5
NC 4
NP 3
F- 2
F- 1
FDP
D7002
RD9.1ES/B2
C7021
OPEN
C7020
OPEN
C7002
10/50
R7013
10k
IC7001
M35500BGP
G6 LED4 ET REC(H) LED2 LED1 VEE VEE SCLK Sout Sin CS
G5 G4 G3 G2 G1 S1 S2 S3 S4 S5 S6
S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 VDD
AN0 AN1 AN2 AN3 AN4 AN5 RESET Xin VSS Xout VDD
D7005
OPEN
D7004
OPEN
D7010
OPEN
D7009
OPEN
R7041
OPEN
R7040
OPEN
R7001 470
R7002 470
R7003 470
R7004 470
C7001
0.001
R7017
10k
#R7005 10k
#R7006 10k
#R7007 10k
#R7008 10k
C7010
0.1
C7009
22p
C7008
1
C7007
100/6.3
C7019
0.022
R7009 OPEN
R7010 OPEN
C7014 0.01
C7013 0.01
C7012 OPEN
D7003 OPEN
R7015 SHORT
R7014 0
C7011
220/6.3
IC7002
GPU1U291Q
V.OUT VCC GND
CN7003
CN7007
D7012
SLR-34DU3F
R7046
330
R7047
330
D7013
SLR-342MG3F
94 LED
OPEN
RCU5V
DC3.5V(-)
DC3.5V(+)
-28V
TO SW.REG
(Page 4-10)
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
STB
RC
J2
J1
AL5V
GND
TO SYSCON
(Page 4-7)
CN7001
JSA
JSB
T1
T2
T3
T4
GND
T6
KEY OUT
ONLY USED FOR HR-VP68U/U(C) & HR-VP680U/U(C)
28 MINI FRONT
#CN7002
#R7043
2.7k
#R7044
4.7k
#R7045
6.8k
#S7021
REW
#S7022
FF
#S7023
PLAY
S7024
OPEN
S7025
OPEN
S7026
OPEN
S7027
OPEN
R7020
10k
R7021
1.2k
R7022
1.8k
R7023
2.2k
R7024
2.7k
#R7025
4.7k
B7002
0Ω
B7001
OPEN
S7001
POWER
S7016
OK
S7004
CH−
S7010
SP/EP
S7011
REC
#S7008
R7030
10k
R7031
1.2k
R7032
1.8k
R7033
2.2k
#R7034
#R7035
4.7k
#R7036
6.8k
B7003
OPEN
B7004
OPEN
B7006
0Ω
B7008
OPEN
B7005
0Ω
B7007
OPEN
TP7001
TEST
R7037
56k
TPGND
S7002
MENU
S7006
CH+
S7012
OPEN
S7014
OPEN
S7015
PAUSE
S7013
STOP/EJECT
ONLY USED FOR HR-VP780U/U(C)
85 SHUTTLE
#CN7008
KEY OUT
T6
GND
T4
T3
T2
T1
JSB
JSA
J1 8
C2 7
J2 6
T4 5
C1 4
T3 3
T2 2
T1 1
#UN7001
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE : Comparison chart of models & marks(#).

| REF.NO. | | R7005-R7008 | R7025 | R7034 | R7035<br>R7036 | S7008 | R7043-R7045<br>CN7002 | S7021-S7023 | CN7008<br>UN7001 |
|---|---|---|---|---|---|---|---|---|---|
| MODEL | HR-VP68U/U(C) | NOT USED | NOT USED | 0Ω | NOT USED | NOT USED | USED | USED | NOT USED |
| | HR-VP680U/U(C) | NOT USED | USED | 0Ω | NOT USED | REVIEW | USED | USED | NOT USED |
| | HR-VP780U/U(C) | USED | USED | 2.7KΩ | USED | PLAY | NOT USED | NOT USED | USED |

## 4.7 BS CONNECTION, C.BOX CTL AND R.PAUSE SCHEMATIC DIAGRAMS

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*

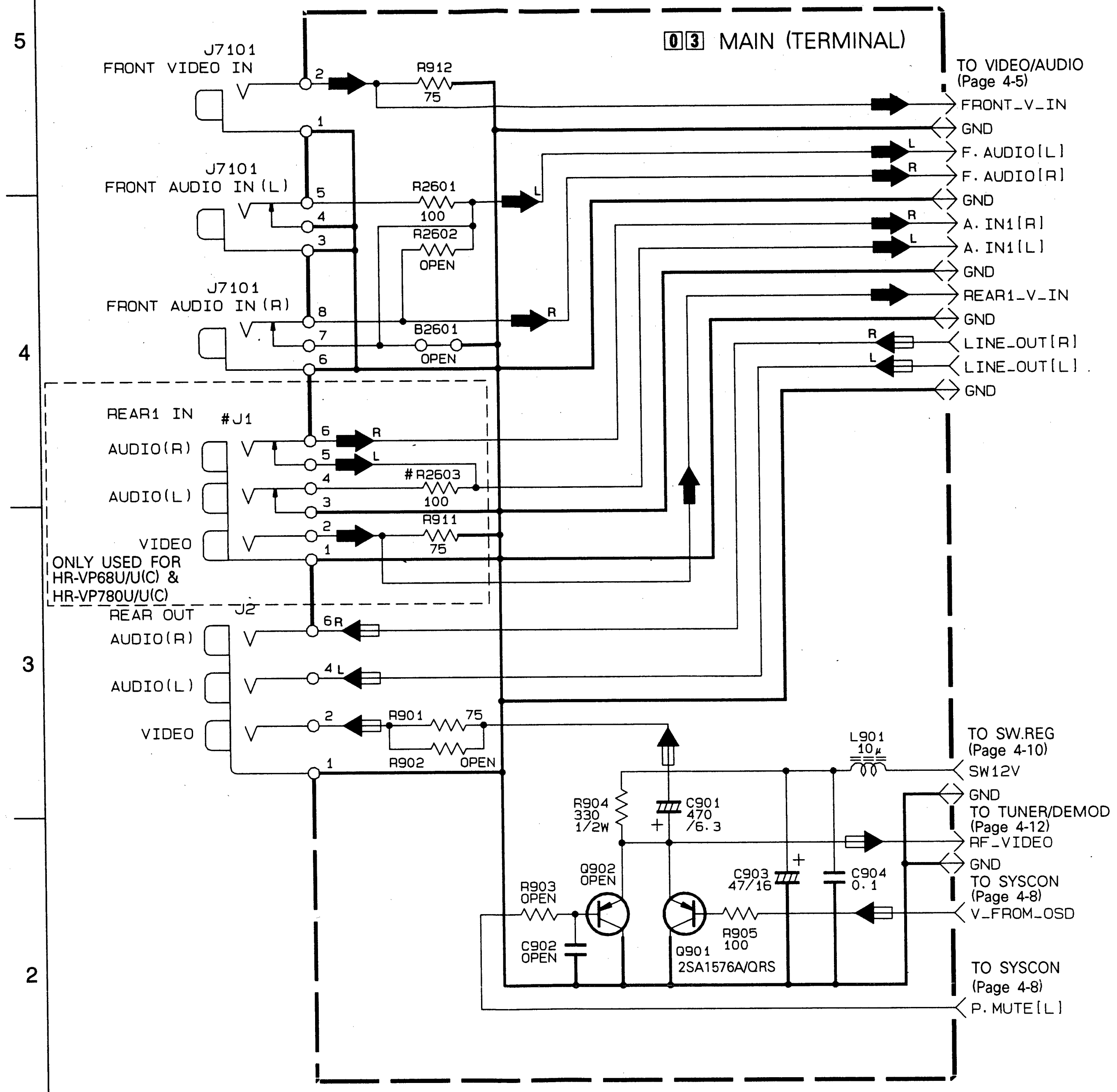

ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
03 MAIN [BS CONNECTION]
TO SW.REG (Page 4-10)
17V
AL5.8V
SW12V
GND
TO SYSCON (Page 4-7)
EV_MASK/BS_P.CTL
CTL8
BS_ANT_ON(H)
BIT_IN(H)
I2C_CLK
I2C_DATA
GND
BS_ANT/KILLER_DET/NORMAL_MESECAM
TO BS TUNER CN6203 CN7101
10 BS_ANT
9 ANT_CTL(L)
8 BIT_IN(H)
7 I2C_CLK
6 I2C_DATA
5 GND(C)
4 SW12V
3 AL6V
2 BS_P.CTL(H)
1 AL17V
TO BS TUNER CN6201 CN7102
1 BS_VIDEO
2 GND
3 BS_AUDIO(L)
4 GND
5 BS_AUDIO(R)
TO VIDEO/AUDIO (Page 4-5)
BS_VIDEO
GND
BS_AUDIO(L)
GND
BS_AUDIO(R)
[BS_SUB]
TO BS TUNER CN6202
CN6204
BTT_IN 7
BIT_GND 6
DET_IN 5
DET_GND 4
BIT_OUT 3
BIT_GND 2
DET_OUT 1
R6239 OPEN
R6238 OPEN
J6202
BIT IN
BIT OUT
J6201
DET IN
DET OUT
OPEN
92 C.BOX CTL
#J7105
C.BOX
#R7155 100
TO SYSCON FW3002 (Page 4-8) FW7105
1 C.BOX_CTL
2 LED_RETURN
06 R.PAUSE
#J7104
P.PAUSE AV.COMPU C.BOX
#R7156 100
TO SYSCON FW3001 (Page 4-8) FW7104
1 PAUSE/COMP
2 GND
93 LT BATTERY
BT3001
FW7106
1 BACK_UP
2 GND
OPEN

NOTE : Comparison chart of models & marks(#).

| | REF.NO. | J7104<br>J7105 | R7155<br>R7156 | FW7104<br>FW7105 |
|---|---|---|---|---|
| MODEL | HR-VP68U/U(C) | USED | USED | USED |
| | HR-VP780U/U(C) | USED | USED | USED |
| | HR-VP680U/U(C) | NOT USED | NOT USED | NOT USED |

## 4.8 TERMINAL SCHEMATIC DIAGRAM

*NOTE : When ordering parts, be sure to order according to the Part Number indicated in the Parts List.*


03 MAIN (TERMINAL)
J7101 FRONT VIDEO IN
J7101 FRONT AUDIO IN (L)
J7101 FRONT AUDIO IN (R)
R912 75
R2601 100
R2602 OPEN
B2601 OPEN
REAR1 IN #J1
AUDIO(R)
AUDIO(L)
VIDEO
#R2603 100
R911 75
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
REAR OUT J2
AUDIO(R)
AUDIO(L)
VIDEO
R901 75
R902 OPEN
TO VIDEO/AUDIO (Page 4-5)
FRONT_V_IN
GND
F.AUDIO(L)
F.AUDIO(R)
GND
A.IN1(R)
A.IN1(L)
GND
REAR1_V_IN
GND
LINE_OUT(R)
LINE_OUT(L)
GND
TO SW.REG (Page 4-10)
SW12V
GND
TO TUNER/DEMOD (Page 4-12)
RF_VIDEO
GND
TO SYSCON (Page 4-8)
V_FROM_OSD
TO SYSCON (Page 4-8)
P.MUTE(L)
L901 10μ
R904 330 1/2W
C901 470 /6.3
C903 47/16
C904 0.1
Q902 OPEN
R903 OPEN
C902 OPEN
Q901 2SA1576A/QRS
R905 100

NOTE : Comparison chart of models & marks(#).

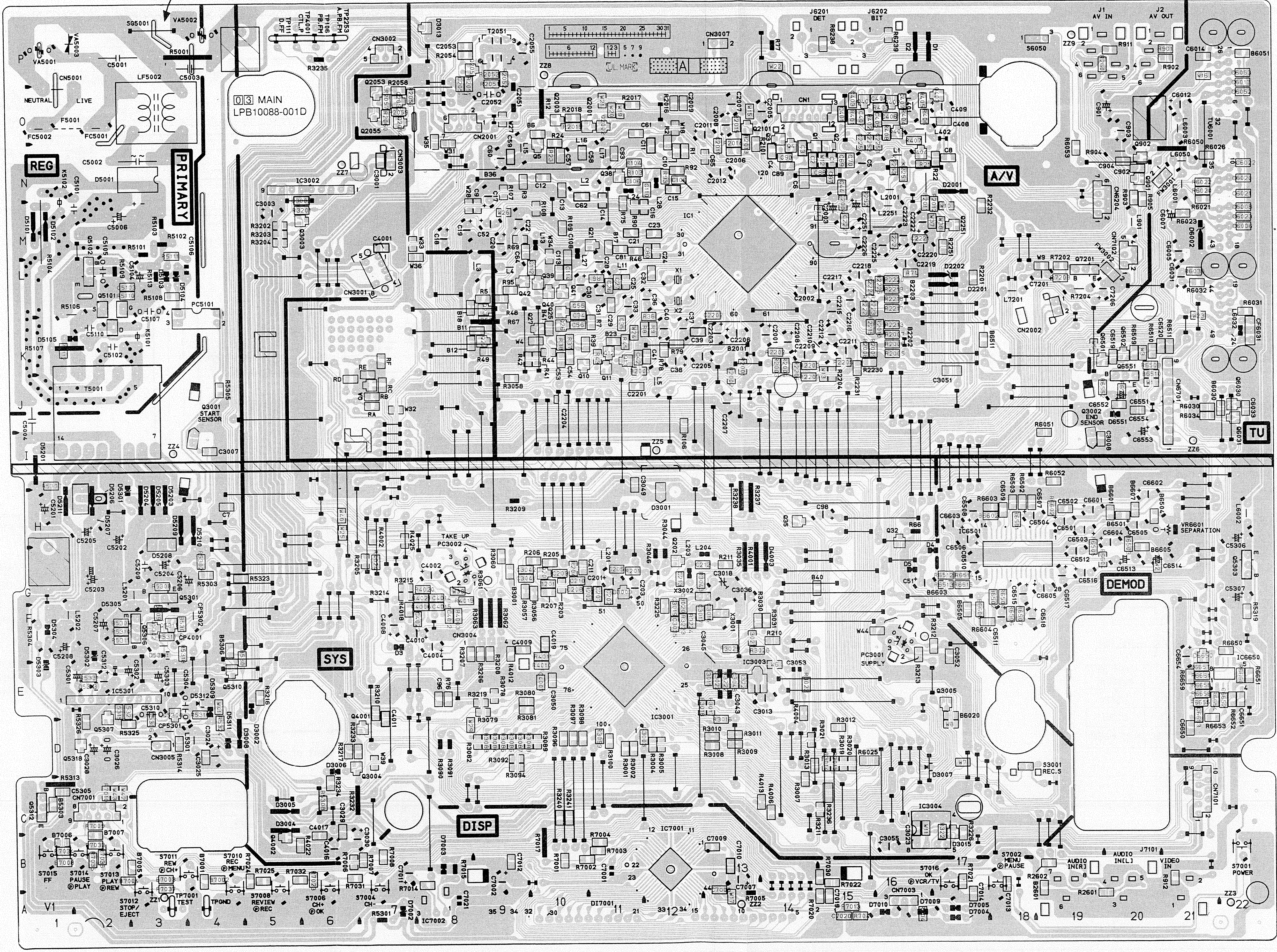
| | REF.NO. | J1 | R2603 |
|---|---|---|---|
| MODEL | HR-VP68U/U(C) | USED | USED |
| | HR-VP780U/U(C) | USED | USED |
| | HR-VP680U/U(C) | NOT USED | NOT USED |

## 4.9 MAIN, A/C HEAD, R.PAUSE, C.BOX CTL, SHUTTLE, MINI FRONT AND LOADING MOTOR CIRCUIT BOARDS

CAUTION:
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).

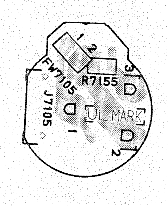
ATTENTION:
POUR UNE PROTECTION PERMANENTE CONTRE LES RISQUE D'INCENDE, REMPLACER LES FUSIBLES PAR UN AUTRE DE MEME TYPE ET DE MEME TENSION.

**DANGEROUS VOLTAGE**



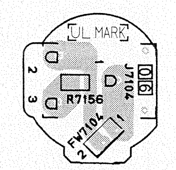
03 MAIN
LPB10088-001D
REG
PRIMARY
A/V
TU
SYS
DEMOD
DISP
NEUTRAL
LIVE
TAKE UP PC3002
PC3001 SUPPLY
Q3001 START SENSOR
Q3002 END SENSOR
VR6601 SEPARATION
J1 AV IN
J2 AV OUT
J6201 DET
J6202 BIT
J7101 AUDIO IN[L]
AUDIO IN[R]
VIDEO IN
S7001 POWER
S7002 MENU @PAUSE
S7016 OK @VCR/TV
S3001 REC.S
S7011 REW @CH+
S7010 REC @MENU
S7015 FF
S7014 PAUSE @PLAY
S7013 PLAY @REW
S7012 STOP/EJECT
S7008 REVIEW @REC
S7006 CH+ @OK
S7004 CH-
TP7001 TEST
TPGND
IC7001
IC7002
IC3001
IC3002
IC3003
IC3004
IC1
IC5301
IC6501
IC6650

— C.BOX CTL —



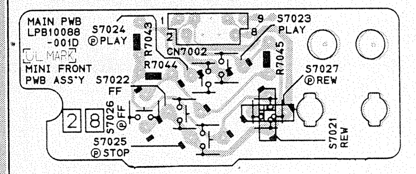
R7155
J7105
FW7105

— R.PAUSE —



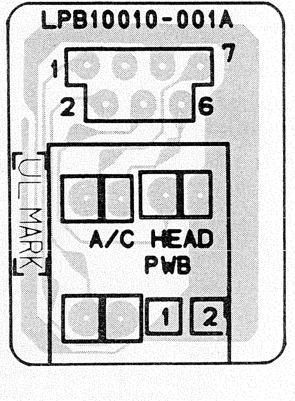
06
R7156
J7104
FW7104

— MINI FRONT —



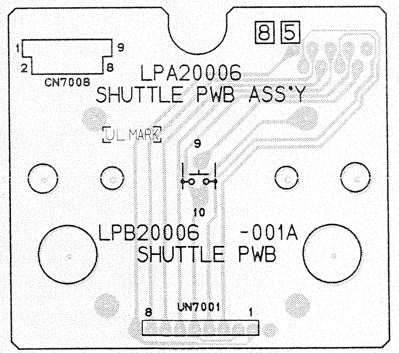
MAIN PWB LPB10088 -001D
MINI FRONT PWB ASS'Y
S7024 @PLAY
S7023 PLAY
S7022 FF
S7027 @REW
S7025 @STOP
S7021 REW
CN7002
R7044
28

— A/C HEAD —



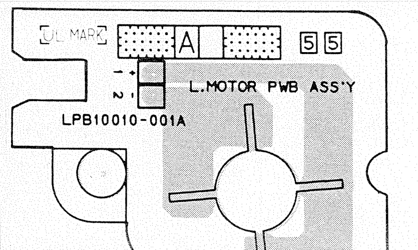
LPB10010-001A
A/C HEAD PWB
1
2
6
7

— SHUTTLE —



85
CN7008
LPA20006 SHUTTLE PWB ASS'Y
LPB20006 -001A SHUTTLE PWB
UN7001

— LOADING MOTOR —



55
L.MOTOR PWB ASS'Y
LPB10010-001A

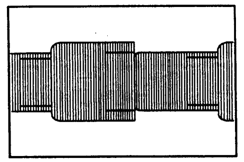
## COMPONENT PARTS LOCATION GUIDE <MAIN>

| REF.NO. | LOCATION | | |
|---|---|---|---|
| **CAPACITOR** | | | |
| C1 | B | C | 15N |
| C2 | B | C | 15N |
| C3 | B | C | 14N |
| C4 | B | C | 14N |
| C5 | A | D | 15N |
| C6 | B | C | 14N |
| C7 | B | C | 4H |
| C8 | B | C | 17N |
| C9 | B | C | 9M |
| C10 | B | C | 12N |
| C11 | B | C | 12N |
| C12 | B | C | 10N |
| C13 | B | C | 10N |
| C14 | B | C | 11M |
| C15 | B | C | 12N |
| C16 | B | C | 12M |
| C17 | A | D | 9M |
| C18 | A | D | 8M |
| C19 | A | D | 9M |
| C20 | A | D | 9M |
| C21 | B | C | 11M |
| C22 | A | D | 9M |
| C23 | B | C | 12M |
| C24 | B | C | 12M |
| C25 | B | C | 11L |
| C26 | B | C | 11L |
| C27 | B | C | 11L |
| C28 | A | D | 11L |
| C29 | B | C | 11L |
| C30 | A | D | 10L |
| C31 | A | D | 11L |
| C32 | B | C | 12L |
| C33 | A | D | 11L |
| C34 | B | C | 10K |
| C35 | B | C | 11K |
| C36 | A | D | 12L |
| C37 | A | D | 12K |
| C38 | A | D | 12K |
| C39 | B | C | 13K |
| C40 | A | D | 12K |
| C41 | B | C | 12K |
| C42 | B | C | 11K |
| C44 | B | C | 15N |
| C51 | A | D | 16G |
| C52 | A | D | 9M |
| C53 | B | C | 10K |
| C54 | B | C | 10K |
| C55 | B | C | 10L |
| C56 | B | C | 10K |
| C57 | B | C | 10N |
| C58 | B | C | 11N |
| C59 | B | C | 9N |
| C60 | A | D | 9N |
| C61 | B | C | 11O |
| C62 | B | C | 11N |
| C64 | B | C | 10M |
| C65 | B | C | 13N |
| C69 | B | C | 15N |
| C70 | B | C | 15N |
| C80 | B | C | 12M |
| C81 | B | C | 11M |
| C87 | B | C | 15N |
| C88 | B | C | 15N |
| C89 | B | C | 14N |
| C90 | B | C | 14N |
| C93 | B | C | 11N |
| C96 | B | C | 8E |
| C98 | A | D | 15H |
| C106 | B | C | 11N |
| C108 | B | C | 10L |
| C109 | B | C | 12N |
| C110 | B | C | 12N |
| C112 | B | C | 10L |
| C113 | B | C | 10L |
| C114 | B | C | 10L |
| C201 | A | D | 11G |
| C202 | B | C | 11G |
| C203 | A | D | 11G |
| C205 | B | C | 11G |
| C207 | B | C | 11G |
| C208 | B | C | 10G |
| C209 | B | C | 10G |
| C210 | B | C | 10G |
| C211 | B | C | 10G |
| C212 | B | C | 13G |
| C213 | B | C | 12G |
| C401 | B | C | 15O |
| C402 | B | C | 15O |
| C403 | B | C | 15O |
| C404 | B | C | 16O |
| C405 | B | C | 16O |
| C406 | B | C | 16O |
| C407 | B | C | 16O |
| C408 | B | C | 17O |
| C409 | A | D | 17O |
| C901 | A | D | 20O |
| C902 | B | C | 20N |
| C903 | A | D | 20O |
| C904 | B | C | 20N |
| C2001 | A | D | 14K |
| C2002 | A | D | 14L |
| C2003 | A | D | 15M |
| C2004 | B | C | 15M |
| C2005 | A | D | 14O |
| C2006 | B | C | 13N |
| C2007 | A | D | 13O |
| C2008 | A | D | 13O |
| C2009 | B | C | 12O |
| C2010 | B | C | 13N |
| C2011 | A | D | 13O |
| C2012 | A | D | 13N |
| C2051 | A | D | 9O |
| C2052 | A | D | 9O |
| C2053 | B | C | 9P |
| C2054 | B | C | 8O |
| C2055 | A | D | 10P |
| C2201 | B | C | 11J |
| C2202 | B | C | 13K |
| C2203 | A | D | 13K |
| C2204 | B | C | 10J |
| C2205 | A | D | 13K |
| C2206 | A | D | 13K |
| C2207 | A | D | 13J |
| C2208 | A | D | 14K |
| C2209 | A | D | 14K |
| C2210 | A | D | 15K |
| C2211 | A | D | 15K |
| C2212 | A | D | 15K |
| C2215 | A | D | 15K |
| C2216 | A | D | 15L |
| C2217 | A | D | 15L |
| C2218 | A | D | 15L |
| C2219 | A | D | 16L |
| C2220 | A | D | 16M |
| C2221 | B | C | 16M |
| C2222 | A | D | 16M |
| C2223 | A | D | 16M |
| C2224 | B | C | 16M |
| C2225 | A | D | 16M |
| C2226 | A | D | 15M |
| C2227 | B | C | 15M |
| C2251 | A | D | 15N |
| C2252 | B | C | 15M |
| C2253 | B | C | 16N |
| C2254 | B | C | 15N |
| C3001 | B | C | 7N |
| C3002 | B | C | 6M |
| C3003 | A | D | 5M |
| C3007 | B | C | 4I |
| C3008 | B | C | 20I |
| C3013 | A | D | 14E |
| C3015 | B | C | 13E |
| C3016 | B | C | 13F |
| C3017 | B | C | 13F |
| C3018 | A | D | 13G |
| C3019 | B | C | 12F |
| C3020 | B | C | 12F |
| C3022 | B | C | 13E |
| C3023 | B | C | 16B |
| C3024 | A | D | 4D |
| C3025 | B | C | 4D |
| C3026 | A | D | 2D |
| C3028 | A | D | 2D |
| C3029 | B | C | 6B |
| C3030 | A | D | 6B |
| C3035 | B | C | 12F |
| C3036 | A | D | 13G |
| C3041 | B | C | 9G |
| C3042 | B | C | 9G |
| C3043 | A | D | 13E |
| C3045 | A | D | 13E |
| C3048 | B | C | 13E |
| C3049 | B | C | 11I |
| C3050 | B | C | 10E |
| C3051 | B | C | 17J |
| C3052 | B | C | 17E |
| C3053 | A | D | 14E |
| C3055 | A | D | 16B |
| C4001 | B | C | 7M |
| C4002 | A | D | 8G |
| C4004 | A | D | 8F |
| C4006 | B | C | 8F |
| C4007 | B | C | 10E |
| C4008 | A | D | 7F |
| C4009 | B | C | 9F |
| C4010 | A | D | 8F |
| C4011 | B | C | 7D |
| C4012 | B | C | 8F |
| C4014 | B | C | 8G |
| C4015 | B | C | 8F |
| C4016 | A | D | 6B |
| C4017 | B | C | 6B |
| C4019 | B | C | 10F |
| C4022 | B | C | 8F |
| C5001 | A | D | 2P |
| C5002 | A | D | 2N |
| C5003 | A | D | 4P |
| C5004 | A | D | 1I |
| C5006 | A | D | 2M |
| C5101 | A | D | 2M |
| C5102 | A | D | 2K |
| C5103 | B | C | 3L |
| C5104 | A | D | 3L |
| C5105 | A | D | 2L |
| C5106 | A | D | 4L |
| C5107 | A | D | 3L |
| C5110 | A | D | 2K |
| C5201 | A | D | 1H |
| C5202 | A | D | 3H |
| C5203 | A | D | 2G |
| C5204 | A | D | 3G |
| C5205 | A | D | 2H |
| C5206 | A | D | 4G |
| C5207 | A | D | 2F |
| C5208 | A | D | 1F |
| C5209 | A | D | 3G |
| C5301 | A | D | 2E |
| C5302 | A | D | 3E |
| C5303 | A | D | 3E |
| C5304 | A | D | 4E |
| C5305 | B | C | 1C |
| C5306 | A | D | 22H |
| C5307 | A | D | 22G |
| C5310 | A | D | 3E |
| C5312 | A | D | 2E |
| C6005 | A | D | 21L |
| C6006 | B | C | 22M |
| C6007 | A | D | 21M |
| C6008 | B | C | 22M |
| C6012 | A | D | 21O |
| C6013 | B | C | 22O |
| C6014 | B | C | 21P |
| C6020 | B | C | 22N |
| C6021 | B | C | 22N |
| C6022 | B | C | 22N |
| C6023 | B | C | 22M |
| C6031 | A | D | 21L |
| C6033 | B | C | 22J |
| C6052 | B | C | 22O |
| C6053 | B | C | 22P |
| C6501 | A | D | 19H |
| C6502 | B | C | 19H |
| C6503 | A | D | 19H |
| C6504 | A | D | 18H |
| C6505 | A | D | 20H |
| C6506 | A | D | 17H |
| C6507 | B | C | 18H |
| C6508 | A | D | 17H |
| C6509 | B | C | 18H |
| C6510 | A | D | 17G |
| C6511 | A | D | 18F |
| C6512 | A | D | 19G |
| C6513 | A | D | 20G |
| C6514 | A | D | 20G |
| C6515 | A | D | 18G |
| C6516 | A | D | 19G |
| C6517 | A | D | 19G |
| C6518 | A | D | 18F |
| C6519 | B | C | 20K |
| C6520 | B | C | 21K |
| C6551 | A | D | 20J |
| C6552 | B | C | 20J |
| C6553 | A | D | 20I |
| C6554 | B | C | 20J |
| C6601 | A | D | 19H |
| C6602 | A | D | 20H |
| C6603 | A | D | 17H |
| C6604 | A | D | 20G |
| C6605 | A | D | 18G |
| C6650 | B | C | 21D |
| C6651 | B | C | 22E |
| C6652 | B | C | 22E |
| C6653 | B | C | 21D |
| C6654 | A | D | 21F |
| C7001 | A | D | 11B |
| C7002 | A | D | 9B |
| C7007 | A | D | 13B |
| C7008 | B | C | 13A |
| C7009 | B | C | 13B |
| C7010 | B | C | 13B |
| C7011 | A | D | 7B |
| C7012 | B | C | 9B |
| C7013 | B | C | 18B |
| C7014 | B | C | 17A |
| C7019 | B | C | 15A |
| C7020 | B | C | 15A |
| C7021 | A | D | 8A |
| C7201 | A | D | 19L |
| C7206 | A | D | 20L |
| **CONNECTOR** | | | |
| CN1 | A | D | 14O |
| CN2001 | A | D | 9O |
| CN2002 | A | D | 19L |
| CN3001 | A | D | 7L |
| CN3002 | A | D | 7P |
| CN3003 | A | D | 7N |
| CN3004 | A | D | 9F |
| CN3005 | A | D | 3D |
| CN3007 | A | D | 13P |
| CN5001 | A | D | 1O |
| CN6204 | A | D | 19M |
| CN6701 | A | D | 21I |
| CN7001 | A | D | 2C |
| CN7003 | A | D | 16A |
| CN7101 | A | D | 21C |
| CN7102 | A | D | 20L |
| **DIODE** | | | |
| D1 | A | D | 17P |
| D2 | A | D | 16P |
| D3 | A | D | 7F |
| D4 | A | D | 16G |
| D5 | A | D | 16G |
| D2001 | A | D | 17N |
| D2201 | A | D | 16L |
| D2202 | A | D | 16L |
| D3001 | A | D | 12H |
| D3002 | A | D | 5D |
| D3004 | A | D | 5C |
| D3005 | A | D | 5C |
| D3006 | A | D | 6D |
| D3007 | B | C | 16D |
| D3008 | A | D | 4E |
| D3009 | B | C | 11G |
| D3013 | B | C | 8P |
| D3015 | B | C | 17B |
| D4003 | A | D | 14H |
| D5001 | B | C | 3N |
| D5101 | A | D | 1M |
| D5102 | A | D | 1M |
| D5103 | A | D | 3L |
| D5104 | A | D | 3L |
| D5105 | A | D | 2K |
| D5201 | A | D | 1I |
| D5203 | A | D | 3I |
| D5204 | A | D | 3I |
| D5205 | A | D | 3I |
| D5206 | A | D | 2H |
| D5207 | A | D | 2I |
| D5208 | A | D | 3H |
| D5209 | A | D | 3H |
| D5210 | A | D | 4H |
| D5211 | A | D | 1H |
| D5301 | A | D | 3I |
| D5302 | A | D | 2F |
| D5303 | A | D | 1E |
| D5304 | A | D | 1F |
| D5305 | A | D | 3F |
| D5308 | B | C | 3F |
| D5309 | A | D | 4D |
| D5311 | A | D | 4D |
| D5312 | B | C | 4E |
| D5313 | B | C | 2E |
| D6002 | A | D | 21L |
| D6551 | A | D | 20J |
| D6650 | B | C | 21E |
| D7002 | A | D | 7A |
| D7003 | A | D | 8B |
| D7004 | A | D | 17A |
| D7005 | A | D | 17A |
| D7009 | A | D | 16A |
| D7010 | A | D | 16A |
| **IC** | | | |
| IC1 | B | C | 13M |
| IC3001 | B | C | 11E |
| IC3002 | A | D | 7N |
| IC3003 | B | C | 13E |
| IC3004 | A | D | 16C |
| IC5301 | A | D | 2E |
| IC6501 | B | C | 18G |
| IC6650 | B | C | 22E |
| IC7001 | B | C | 12B |
| IC7002 | A | D | 8A |
| **JACK** | | | |
| J1 | A | D | 20P |
| J2 | A | D | 21P |
| J6201 | A | D | 15P |
| J6202 | A | D | 16P |
| J7101 | A | D | 20A |
| **COIL** | | | |
| L1 | A | D | 16N |
| L2 | A | D | 10N |
| L3 | A | D | 9L |
| L4 | A | D | 9L |
| L5 | A | D | 12J |
| L11 | A | D | 11L |
| L13 | A | D | 10M |
| L15 | A | D | 9O |
| L16 | A | D | 10N |
| L17 | A | D | 11N |
| L24 | A | D | 11N |
| L27 | A | D | 10L |
| L28 | A | D | 12N |
| L201 | A | D | 11G |
| L203 | A | D | 12G |
| L204 | A | D | 13G |
| L401 | A | D | 16O |
| L402 | A | D | 17O |
| L901 | A | D | 20M |
| L2001 | A | D | 16N |
| L2251 | A | D | 16M |
| L5201 | A | D | 3G |
| L5202 | A | D | 1F |
| L5301 | A | D | 4D |
| L6001 | A | D | 21N |
| L6002 | A | D | 22H |
| L6003 | A | D | 21O |
| L6032 | A | D | 22K |
| L6050 | A | D | 21N |
| L7201 | A | D | 18L |
| **TRANSISTOR** | | | |
| Q1 | B | C | 15N |
| Q2 | B | C | 15N |
| Q3 | B | C | 14O |
| Q4 | B | C | 14N |
| Q5 | B | C | 10N |
| Q10 | B | C | 11K |
| Q11 | B | C | 11K |
| Q12 | B | C | 11K |
| Q13 | B | C | 11K |
| Q21 | B | C | 11M |
| Q22 | B | C | 9K |
| Q23 | B | C | 9L |
| Q25 | B | C | 10L |
| Q26 | B | C | 10K |
| Q27 | B | C | 10K |
| Q32 | B | C | 16H |
| Q35 | B | C | 14H |
| Q38 | B | C | 11N |
| Q39 | B | C | 10L |
| Q40 | B | C | 10L |
| Q41 | B | C | 10L |
| Q42 | B | C | 9L |
| Q201 | B | C | 10G |
| Q202 | B | C | 12G |
| Q401 | B | C | 15O |
| Q402 | B | C | 16O |
| Q403 | B | C | 17O |
| Q404 | B | C | 16N |
| Q405 | B | C | 16O |
| Q901 | B | C | 20N |
| Q902 | B | C | 20N |
| Q2001 | B | C | 11O |
| Q2002 | B | C | 11O |
| Q2003 | B | C | 10O |
| Q2051 | B | C | 9P |
| Q2052 | B | C | 7O |
| Q2053 | B | C | 7O |
| Q2054 | B | C | 7O |
| Q2055 | B | C | 7O |
| Q2101 | B | C | 13O |
| Q2251 | B | C | 17M |
| Q3001 | A | D | 4I |
| Q3002 | A | D | 19I |
| Q3003 | B | C | 6M |
| Q3004 | B | C | 6D |
| Q3005 | B | C | 17E |
| Q4001 | B | C | 7D |
| Q4002 | B | C | 5B |
| Q5101 | A | D | 2L |
| Q5102 | A | D | 2L |
| Q5301 | A | D | 3G |
| Q5302 | B | C | 3F |
| Q5303 | A | D | 22G |
| Q5306 | A | D | 3F |
| Q5307 | B | C | 2E |
| Q5308 | B | C | 3E |
| Q5310 | B | C | 4E |
| Q5311 | B | C | 3F |
| Q5312 | A | D | 1C |
| Q5318 | B | C | 2D |
| Q6030 | B | C | 22J |
| Q6031 | B | C | 22J |
| Q6501 | B | C | 20K |
| Q6502 | B | C | 20K |
| Q6551 | A | D | 20J |
| Q7201 | A | D | 19L |
| **RESISTOR** | | | |
| R1 | B | C | 12N |
| R2 | B | C | 12N |
| R3 | B | C | 10N |
| R5 | B | C | 9L |
| R6 | B | C | 11L |
| R7 | B | C | 11K |
| R8 | B | C | 12K |
| R9 | B | C | 12K |
| R12 | A | D | 10O |
| R21 | B | C | 16N |
| R22 | B | C | 17N |
| R23 | B | C | 10N |
| R24 | B | C | 10N |
| R36 | B | C | 12K |
| R37 | B | C | 10K |
| R38 | B | C | 10K |
| R39 | B | C | 11K |
| R41 | B | C | 10K |
| R42 | B | C | 10K |
| R43 | B | C | 11K |
| R44 | B | C | 10K |
| R45 | B | C | 11K |
| R46 | B | C | 11M |
| R48 | B | C | 9L |
| R49 | B | C | 9K |
| R50 | B | C | 9K |
| R66 | A | D | 16H |
| R67 | A | D | 8K |
| R69 | B | C | 9M |
| R71 | B | C | 16L |
| R75 | B | C | 11M |
| R76 | B | C | 8E |
| R77 | A | D | 14P |
| R78 | B | C | 12K |
| R79 | B | C | 12K |
| R90 | B | C | 11M |
| R92 | B | C | 12N |
| R93 | B | C | 12N |
| R95 | B | C | 9L |
| R103 | B | C | 11N |
| R104 | B | C | 11N |
| R106 | B | C | 12J |
| R107 | B | C | 9N |
| R108 | B | C | 10M |
| R109 | B | C | 10M |
| R201 | B | C | 11G |
| R202 | B | C | 11G |
| R203 | B | C | 10G |
| R204 | B | C | 10G |
| R205 | B | C | 10G |
| R206 | B | C | 10G |
| R207 | B | C | 10G |
| R210 | B | C | 14F |
| R211 | B | C | 13G |
| R401 | B | C | 15O |
| R402 | B | C | 16O |
| R403 | B | C | 16O |
| R404 | B | C | 16O |
| R405 | B | C | 16O |
| R406 | B | C | 16O |
| R407 | B | C | 16N |
| R408 | B | C | 16O |
| R901 | B | C | 21P |
| R902 | B | C | 21P |
| R903 | B | C | 20M |
| R904 | A | D | 20N |
| R905 | B | C | 20M |
| R911 | B | C | 20P |
| R912 | B | C | 21B |
| R2001 | B | C | 13K |
| R2002 | B | C | 13J |
| R2003 | B | C | 14K |
| R2004 | B | C | 14K |
| R2005 | B | C | 16K |
| R2006 | B | C | 16K |
| R2007 | B | C | 16K |
| R2008 | B | C | 15K |
| R2009 | B | C | 16K |
| R2010 | B | C | 16K |
| R2011 | B | C | 16M |
| R2012 | B | C | 17M |
| R2013 | B | C | 13N |
| R2014 | B | C | 13N |
| R2015 | B | C | 13O |
| R2016 | B | C | 12O |
| R2017 | B | C | 11O |
| R2018 | B | C | 10O |
| R2019 | B | C | 10O |
| R2051 | B | C | 9O |
| R2052 | B | C | 9P |
| R2053 | B | C | 9P |
| R2054 | B | C | 9P |
| R2055 | B | C | 9O |
| R2056 | B | C | 8O |
| R2057 | B | C | 7O |
| R2058 | B | C | 7O |
| R2059 | B | C | 7O |
| R2060 | B | C | 7O |
| R2101 | B | C | 14N |
| R2201 | B | C | 17L |
| R2202 | B | C | 14K |
| R2203 | B | C | 14K |
| R2204 | B | C | 15J |
| R2205 | B | C | 15K |
| R2206 | B | C | 14J |
| R2207 | B | C | 14J |
| R2213 | B | C | 16K |
| R2215 | B | C | 16K |
| R2217 | B | C | 16L |
| R2218 | B | C | 16L |
| R2219 | B | C | 16L |
| R2220 | B | C | 16L |
| R2222 | B | C | 15L |
| R2223 | B | C | 16L |
| R2224 | B | C | 16L |
| R2225 | B | C | 16L |
| R2230 | B | C | 15K |
| R2231 | B | C | 15K |
| R2232 | B | C | 17M |
| R2251 | B | C | 17M |
| R2601 | B | C | 20A |
| R2602 | B | C | 19B |
| R2603 | B | C | 20P |
| R3001 | B | C | 11D |
| R3002 | B | C | 11D |
| R3003 | B | C | 12D |
| R3004 | B | C | 12D |
| R3005 | B | C | 12D |
| R3007 | B | C | 14C |
| R3008 | B | C | 13D |
| R3009 | B | C | 13D |
| R3010 | B | C | 13D |
| R3011 | B | C | 13D |
| R3012 | B | C | 15D |
| R3013 | B | C | 14D |
| R3014 | B | C | 15D |
| R3015 | B | C | 15D |
| R3016 | B | C | 13D |
| R3017 | B | C | 13E |
| R3018 | B | C | 13E |
| R3019 | B | C | 15D |
| R3020 | B | C | 15D |
| R3021 | B | C | 14D |
| R3022 | B | C | 14E |
| R3026 | B | C | 13F |
| R3027 | B | C | 13F |
| R3029 | B | C | 13F |
| R3030 | B | C | 14F |
| R3031 | B | C | 14F |
| R3035 | A | D | 13H |
| R3043 | B | C | 13G |
| R3044 | A | D | 12G |
| R3046 | A | D | 12G |
| R3056 | B | C | 10G |
| R3057 | B | C | 9G |
| R3058 | B | C | 9J |
| R3060 | B | C | 9G |
| R3061 | A | D | 9G |
| R3062 | A | D | 9G |
| R3063 | A | D | 9G |
| R3078 | B | C | 9E |
| R3079 | B | C | 9E |
| R3080 | B | C | 9E |
| R3081 | B | C | 9E |
| R3082 | B | C | 9D |
| R3083 | B | C | 9D |
| R3084 | B | C | 9D |
| R3085 | B | C | 9D |
| R3086 | B | C | 9D |
| R3087 | B | C | 9D |
| R3088 | B | C | 10D |
| R3089 | B | C | 10D |
| R3090 | A | D | 8D |
| R3091 | A | D | 8D |
| R3092 | B | C | 9D |
| R3094 | B | C | 9D |
| R3096 | B | C | 10D |
| R3097 | B | C | 10D |
| R3098 | B | C | 10D |
| R3099 | B | C | 11D |
| R3100 | B | C | 11D |
| R3201 | B | C | 6M |
| R3202 | B | C | 5M |
| R3203 | B | C | 5M |
| R3204 | B | C | 5M |
| R3205 | B | C | 7G |
| R3206 | B | C | 9F |
| R3207 | B | C | 9F |
| R3208 | B | C | 9F |
| R3209 | A | D | 9H |
| R3210 | B | C | 7E |
| R3211 | B | C | 15C |
| R3212 | B | C | 17F |
| R3213 | B | C | 16F |
| R3214 | B | C | 7G |
| R3215 | B | C | 7G |
| R3216 | B | C | 5E |
| R3217 | B | C | 6D |
| R3219 | B | C | 9E |
| R3220 | B | C | 13E |
| R3222 | B | C | 13E |
| R3223 | B | C | 12F |
| R3224 | B | C | 12F |
| R3225 | B | C | 12F |
| R3226 | B | C | 17B |
| R3227 | B | C | 17B |
| R3232 | A | D | 7C |
| R3233 | B | C | 7D |
| R3234 | B | C | 6C |
| R3235 | A | D | 6P |
| R3236 | B | C | 15C |
| R3237 | A | D | 13I |
| R3238 | A | D | 13I |
| R3240 | B | C | 10C |
| R3241 | B | C | 10C |
| R4001 | A | D | 13G |
| R4002 | B | C | 7H |
| R4003 | B | C | 8F |
| R4004 | B | C | 14E |
| R4006 | B | C | 14C |
| R4010 | B | C | 10E |
| R4011 | B | C | 10F |
| R4012 | B | C | 9F |
| R4013 | B | C | 14C |
| R4018 | B | C | 7F |
| R4019 | B | C | 8G |
| R4020 | B | C | 8G |
| R4021 | B | C | 8G |
| R4022 | B | C | 6B |
| R4024 | B | C | 7G |
| R4025 | B | C | 7H |
| R5001 | A | D | 4P |
| R5101 | A | D | 3M |
| R5102 | A | D | 3M |
| R5103 | A | D | 3M |
| R5104 | A | D | 1L |
| R5106 | A | D | 1L |
| R5107 | A | D | 2K |
| R5108 | B | C | 3L |
| R5109 | A | D | 2L |
| R5110 | B | C | 3L |
| R5111 | B | C | 3M |
| R5112 | B | C | 1K |
| R5113 | A | D | 3L |
| R5301 | A | D | 7A |
| R5302 | B | C | 4G |
| R5303 | B | C | 4G |
| R5304 | A | D | 1F |
| R5305 | B | C | 4J |
| R5306 | B | C | 3D |
| R5307 | B | C | 1I |
| R5308 | B | C | 3G |
| R5309 | B | C | 3F |
| R5310 | B | C | 2F |
| R5311 | B | C | 2F |
| R5313 | A | D | 1C |
| R5314 | B | C | 3D |
| R5315 | B | C | 2E |
| R5316 | B | C | 4E |
| R5317 | B | C | 3F |
| R5318 | B | C | 3F |
| R5319 | B | C | 22F |
| R5323 | B | C | 5G |
| R5324 | B | C | 4D |
| R5325 | B | C | 3D |
| R5326 | B | C | 2D |
| R5327 | B | C | 3E |
| R5331 | B | C | 2E |
| R6020 | B | C | 21N |
| R6021 | B | C | 21M |
| R6022 | B | C | 21N |
| R6023 | B | C | 21M |
| R6025 | B | C | 15D |
| R6026 | B | C | 21N |
| R6030 | B | C | 21J |
| R6031 | B | C | 22K |
| R6032 | B | C | 21L |
| R6033 | B | C | 21L |
| R6034 | B | C | 21J |
| R6050 | A | D | 21N |
| R6051 | B | C | 19I |
| R6052 | B | C | 19I |
| R6053 | B | C | 19N |
| R6238 | B | C | 15P |
| R6239 | B | C | 16P |
| R6501 | B | C | 18H |
| R6502 | B | C | 18H |
| R6503 | B | C | 18H |
| R6504 | B | C | 18G |
| R6505 | B | C | 19G |
| R6506 | B | C | 18F |
| R6507 | B | C | 18F |
| R6508 | B | C | 20K |
| R6509 | B | C | 20K |
| R6510 | B | C | 20K |
| R6511 | B | C | 21K |
| R6512 | B | C | 17G |
| R6513 | B | C | 17G |
| R6514 | B | C | 17G |
| R6515 | B | C | 17G |
| R6551 | B | C | 20J |
| R6552 | B | C | 20J |
| R6602 | B | C | 19H |
| R6603 | B | C | 18H |
| R6604 | B | C | 18F |
| R6650 | B | C | 22F |
| R6651 | B | C | 22E |
| R6652 | B | C | 22E |
| R6653 | B | C | 21D |
| R6654 | B | C | 21E |
| R6655 | B | C | 21E |
| R6656 | B | C | 21E |
| R6657 | B | C | 21E |
| R6658 | B | C | 21E |
| R6659 | B | C | 21E |
| R6660 | B | C | 22E |
| R6661 | B | C | 21E |
| R7001 | B | C | 10B |
| R7002 | B | C | 10B |
| R7003 | B | C | 11B |
| R7004 | B | C | 11B |
| R7005 | A | D | 14A |
| R7006 | B | C | 6B |
| R7007 | B | C | 7B |
| R7008 | B | C | 7B |
| R7009 | B | C | 2C |
| R7010 | B | C | 2C |
| R7013 | B | C | 15A |
| R7014 | B | C | 8B |
| R7015 | A | D | 8B |
| R7017 | A | D | 10B |
| R7020 | B | C | 15A |
| R7021 | B | C | 17B |
| R7022 | B | C | 15B |
| R7023 | B | C | 6B |
| R7024 | B | C | 5B |
| R7025 | B | C | 5B |
| R7030 | B | C | 15B |
| R7031 | B | C | 6B |
| R7032 | B | C | 5B |
| R7033 | B | C | 2B |
| R7034 | B | C | 1B |
| R7035 | B | C | 2B |
| R7036 | B | C | 2B |
| R7037 | B | C | 3B |
| R7040 | B | C | 16A |
| R7041 | B | C | 15A |
| R7202 | B | C | 19L |
| R7203 | B | C | 19L |
| R7204 | A | D | 19L |
| **SWITCH** | | | |
| S3001 | A | D | 18C |
| S6050 | A | D | 18P |
| S7001 | A | D | 22B |
| S7002 | A | D | 18B |
| S7004 | A | D | 7B |
| S7006 | A | D | 6B |
| S7008 | A | D | 5B |
| S7010 | A | D | 4B |
| S7011 | A | D | 4B |
| S7012 | A | D | 3B |
| S7013 | A | D | 2B |
| S7014 | A | D | 2B |
| S7015 | A | D | 1B |
| S7016 | A | D | 17B |
| **TEST POINT** | | | |
| TP106 | A | D | 6P |
| TP111 | A | D | 5P |
| TP2253 | A | D | 6P |
| TP4001 | A | D | 6P |
| TP7001 | A | D | 3A |
| TPGND | A | D | 4A |
| **OTHER** | | | |
| CF6031 | A | D | 22K |
| CP4001 | A | D | 3F |
| CP5301 | A | D | 3D |
| CP5302 | A | D | 4F |
| DI7001 | A | D | 12A |
| F5001 | A | D | 1O |
| FC5001 | A | D | 2O |
| FC5002 | A | D | 1O |
| FW3001 | A | D | 21N |
| FW3002 | A | D | 20L |
| K2251 | B | C | 16N |
| K2252 | B | C | 16N |
| K2253 | B | C | 16N |
| K5101 | A | D | 3K |
| K5102 | A | D | 1M |
| LF5002 | A | D | 4O |
| PC3001 | A | D | 16F |
| PC3002 | A | D | 8G |
| PC5101 | A | D | 4L |
| SG5001 | A | D | 3P |
| T2051 | A | D | 9P |
| T5001 | A | D | 1K |
| TU6001 | A | D | 22P |
| VA5001 | A | D | 1P |
| VA5002 | A | D | 4P |
| VA5003 | A | D | 2P |
| VR6601 | A | D | 21H |
| X1 | A | D | 12L |
| X2 | A | D | 12L |
| X3001 | A | D | 13F |
| X3002 | A | D | 12G |

## WAVEFORMS

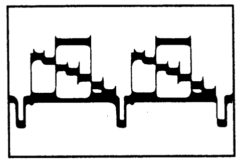
### — VIDEO/AUDIO —

**WF1** IC1-1



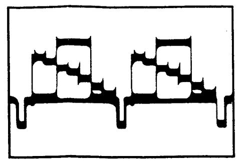
PB 0.52 Vp-p
20 mV/5 msec/DIV

**WF2** IC1-11



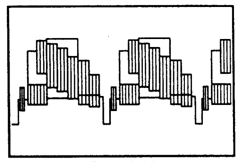
REC/PB 0.5 Vp-p
20 mV/20 µsec/DIV

**WF3** IC1-13



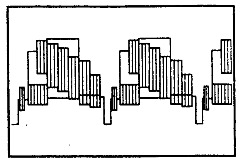
REC/PB 0.5 Vp-p
20 mV/20 µsec/DIV

**WF4** IC1-18



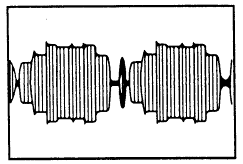
REC 1.0 Vp-p
20 mV/20 µsec/DIV

**WF5** IC1-27



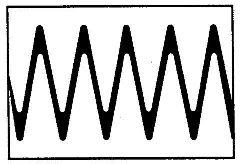
REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

**WF6** IC1-30



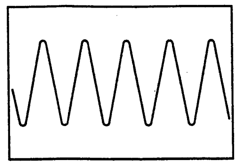
PB 0.64 Vp-p
20 mV/20 µsec/DIV

**WF7** IC1-48



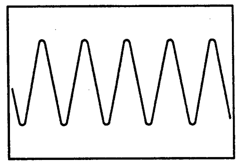
PB 0.72 Vp-p
20 mV/0.5 msec/DIV

**WF8** IC1-52



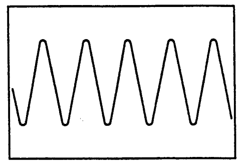
REC 0.12 Vp-p
2 mV/0.5 msec/DIV

**WF9-1** IC1-62



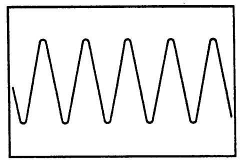
REC 0.9 Vp-p
20 mV/0.5 msec/DIV

**WF9-2** IC1-62



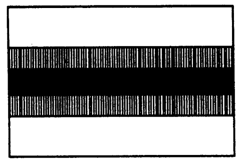
PB 0.8 Vp-p
20 mV/0.5 msec/DIV

**WF10** IC1-80



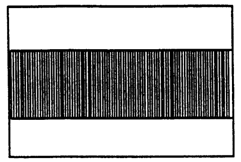
REC 0.2 Vp-p
5 mV/0.5 msec/DIV

**WF11** IC1-97



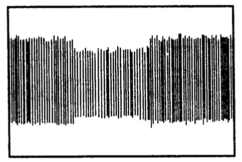
REC 1.4 Vp-p
50 mV/0.5 msec/DIV

**WF12** IC1-105



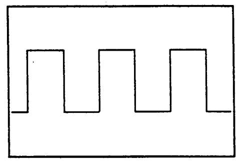
REC 2.2 Vp-p
0.1 V/1 msec/DIV

**WF13** TP2253 A.PB.FM



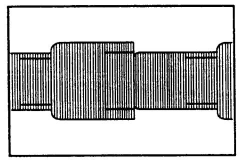
PB 0.68 Vp-p
20 mV/5 msec/DIV

**WF14** TP111 D.FF



REC/PB 3.3 Vp-p
0.1 V/10 msec/DIV

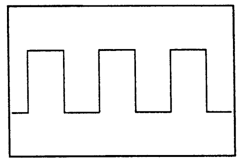
**WF15** TP106 PB.FM



PB 0.56 Vp-p
20 mV/5 msec/DIV

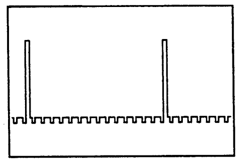
### — SYSCON —

**WF1** CN3002-5 D.FG



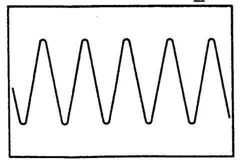
REC/PB 4.3 Vp-p
0.1 V/1 msec/DIV

**WF2** CN3002-4 D.PG



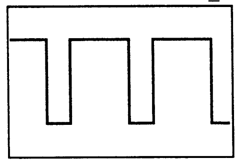
REC/PB 4.5 Vp-p
0.1 V/10 msec/DIV

**WF3** CN3001-2 CAP_FG



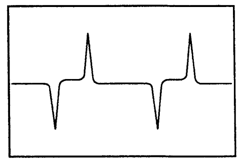
REC/PB 2.4 Vp-p
50 mV/0.5 msec/DIV

**WF4** IC3001-74 CTL_+



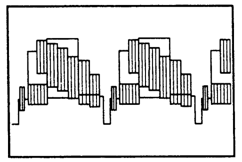
REC 3.8 Vp-p
0.1 V/10 msec/DIV

**WF5** TP4001 CTL.P



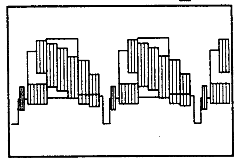
PB 3.3 Vp-p
0.1 V/5 msec/DIV

**WF6** IC3001-49 CVIN



REC/PB 2.1 Vp-p
50 mV/20 µsec/DIV

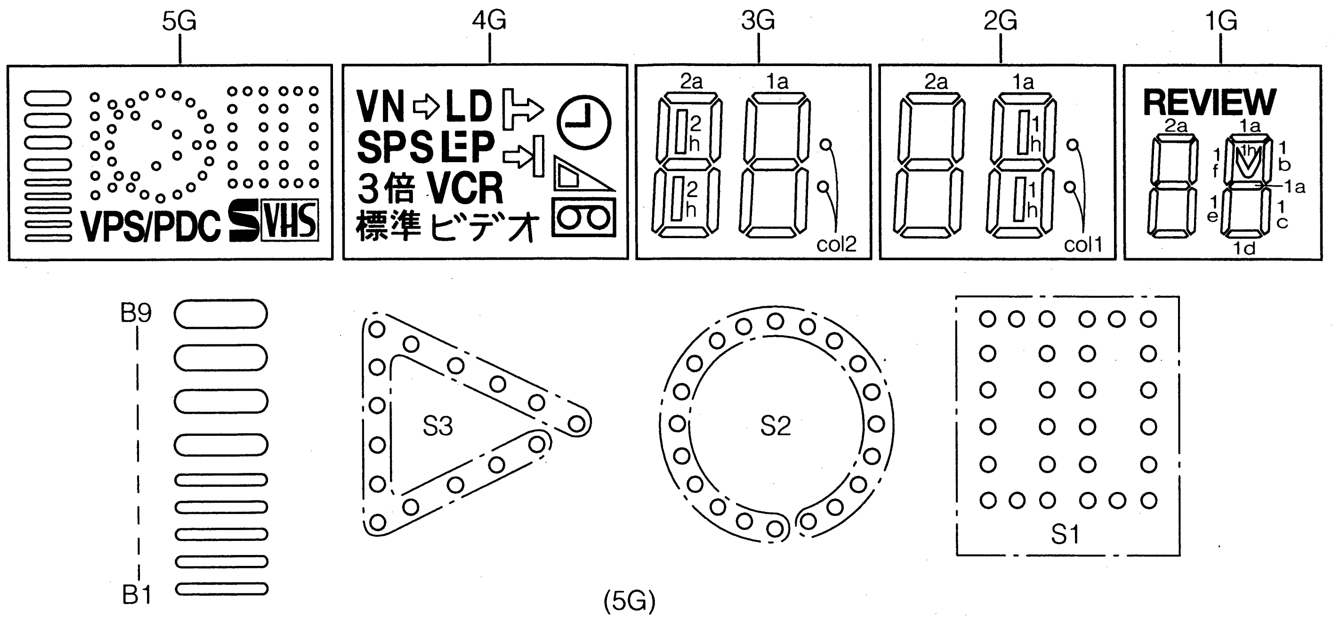
**WF7** IC3001-47 VIDEO_OUT



REC/PB 2.1 Vp-p
50 mV/20 µsec/DIV

## 4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION

### GRID ASSIGNMENT


5G
4G
3G
2G
1G
VPS/PDC
SVHS
VN⇨LD
SPSLP
3倍 VCR
標準ビデオ
2a
1a
h
col2
col1
REVIEW
1f
1b
1a
1e
1c
1d
B9
B1
S3
S2
S1
(5G)

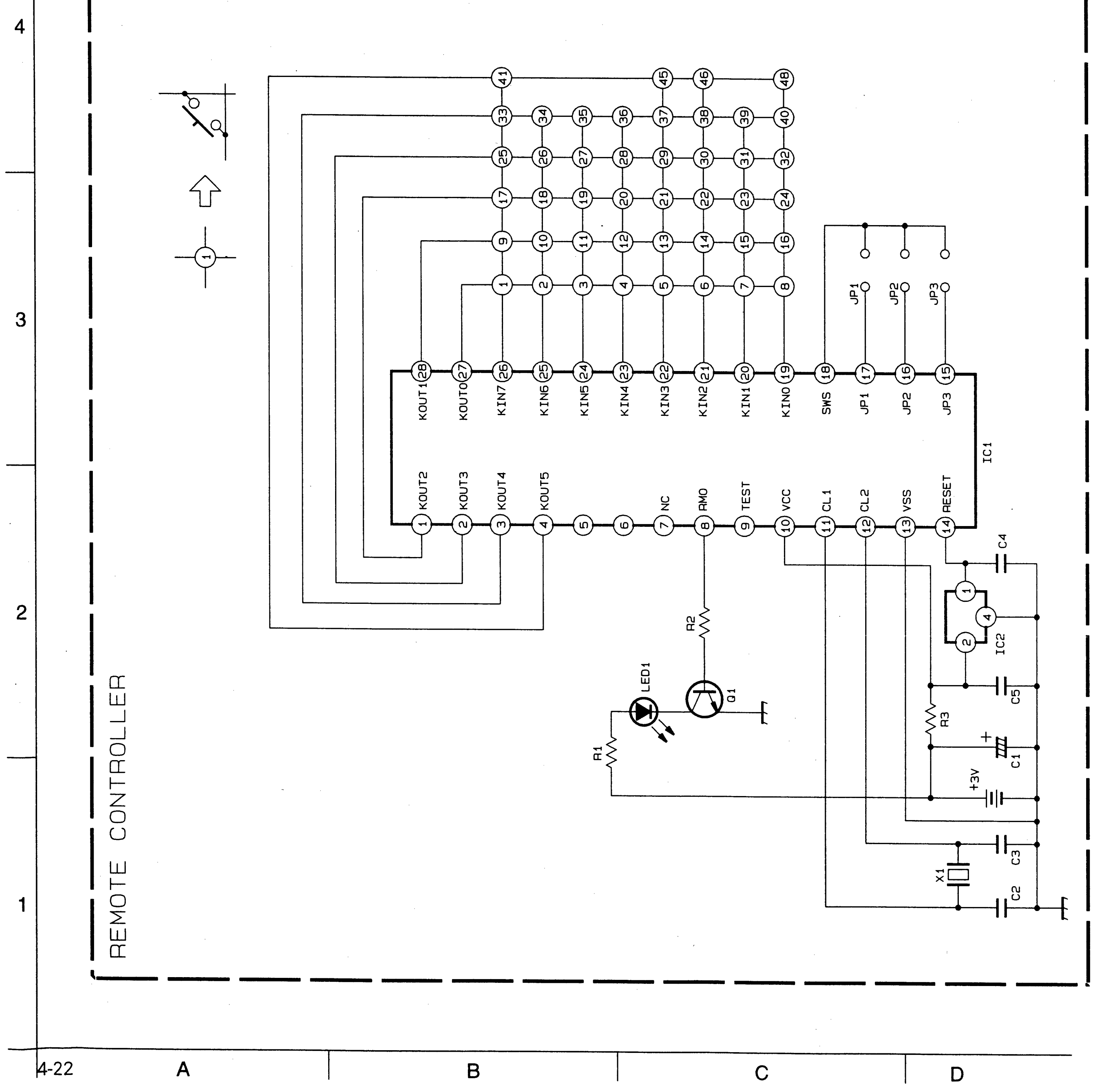
### ANODE CONNECTION

| | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|
| P 1 | S2 | \|⇨ | 1a | 1a | 1a |
| P 2 | S1 | ⇨\| | 1b | 1b | 1b |
| P 3 | S3 | 3倍 | 1f | 1f | 1f |
| P 4 | VPS/PDC | 標準 | 1g | 1g | 1g |
| P 5 | SVHS | ◷ | 1c | 1c | 1c |
| P 6 | — | ◺ | 1e | 1e | 1e |
| P 7 | — | OO | 1d | 1d | 1d |
| P 8 | B9 | VCR | col2 | 1h | 1h |
| P 9 | B8 | ビデオ | 2a | 2a | 2a |
| P10 | B7 | ⇨ | 2b | 2b | 2b |
| P11 | B6 | VN | 2f | 2f | 2f |
| P12 | B5 | LD | 2g | 2g | 2g |
| P13 | B4 | SP | 2c | 2c | 2c |
| P14 | B3 | S (SEP) | 2e | 2e | 2e |
| P15 | B2 | : (SEP) | 2d | 2d | 2d |
| P16 | B1 | LP(SEP) | 2h | col1 | REVIEW |

## 4.11 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

| Key No. | Key Name |
|---|---|
| 1 | START+ |
| 2 | 1 |
| 3 | 4 |
| 4 | STOP+ |
| 5 | DATE+ |
| 6 | CH+ |
| 7 | 3 |
| 8 | 6 |
| 9 | CANSEL/C.RESET |
| 10 | 2 |
| 11 | 7 |
| 12 | 0 |
| 13 | 8 |
| 14 | TIMER |
| 15 | 5 |
| 16 | 9 |
| 17 | PROG |
| 18 | CABLE/DSS |
| 19 | TV |
| 20 | PROG CHEK |
| 21 | SP/EP |
| 22 | SKIP SEARCH |
| 23 | POWER |
| 24 | MBR SET/A/B |
| 25 | START- |
| 26 | TV/VCR |
| 27 | RE-VIEW |
| 28 | STOP- |
| 29 | DATE- |
| 30 | CH- |
| 31 | DISPLAY |
| 32 | AUDIO/MUTE |
| 33 | MENU |
| 34 | REC |
| 35 | REW |
| 36 | PLAY |
| 37 | STOP |
| 38 | FF |
| 39 | PAUSE/STILL |
| 40 | OK/ENTER |
| 41 | <</TV VOL- |
| 45 | Δ/TV CH+ |
| 46 | ∇/TV CH- |
| 48 | >>/TV VOL+ |
| 34+36 | REC+PLAY |
| 34+39 | REC+PAUSE |


4
3
2
1
REMOTE CONTROLLER
41
45
46
48
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16
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3
4
5
6
7
8
JP1
JP2
JP3
KOUT1 28
KOUT0 27
KIN7 26
KIN6 25
KIN5 24
KIN4 23
KIN3 22
KIN2 21
KIN1 20
KIN0 19
SWS 18
JP1 17
JP2 16
JP3 15
IC1
1 KOUT2
2 KOUT3
3 KOUT4
4 KOUT5
5
6
7 NC
8 RMO
9 TEST
10 VCC
11 CL1
12 CL2
13 VSS
14 RESET
C4
IC2
C5
R3
C1
+3V
C3
X1
C2
R2
LED1
Q1
R1
A
B
C
D

## 4.12 VOLTAGE CHARTS

**<VIDEO/AUDIO>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| IC1 | | |
| 1 | 1.4 | 2.1 |
| 2 | 2.9 | 2.9 |
| 3 | 2.5 | 2.5 |
| 4 | 1.9 | 1.4 |
| 5 | 1.9 | 1.5 |
| 6 | 2.4 | 2.1 |
| 7 | 1.5 | 0.8 |
| 8 | 0 | 0 |
| 9 | 2.6 | 3.0 |
| 10 | 2.7 | 2.7 |
| 11 | 3.0 | 3.0 |
| 12 | 2.8 | 2.5 |
| 13 | 3.0 | 3.3 |
| 14 | 2.3 | 2.3 |
| 15 | 0 | 0 |
| 16 | 2.8 | 2.8 |
| 17 | 1.5 | 1.5 |
| 18 | 2.8 | 2.8 |
| 19 | 0 | 2.4 |
| 20 | 2.8 | 2.8 |
| 21 | 2.0 | 2.0 |
| 22 | 2.8 | 2.8 |
| 23 | 2.8 | 2.8 |
| 24 | 5.0 | 5.0 |
| 25 | 0.4 | 0.4 |
| 26 | 0 | 0 |
| 27 | 2.3 | 2.3 |
| 28 | 2.3 | 2.3 |
| 29 | 1.9 | 1.9 |
| 30 | 2.1 | 2.1 |
| 31 | 0 | 0 |
| 32 | 2.7 | 2.7 |
| 33 | 5.0 | 5.0 |
| 34 | 2.7 | 2.2 |
| 35 | 5.0 | 5.0 |
| 36 | 2.7 | 2.7 |
| 37 | 2.3 | 2.3 |
| 38 | 0.3 | 0.3 |
| 39 | 1.2 | 1.2 |
| 40 | - | - |
| 41 | 2.5 | 2.5 |
| 42 | - | - |
| 43 | 0 | 0 |
| 44 | 2.2 | 2.2 |
| 45 | 4.4 | 4.6 |
| 46 | 4.9 | 4.7 |
| 47 | 2.7 | 2.7 |
| 48 | 2.5 | 2.5 |
| 49 | 5.0 | 5.0 |
| 50 | 2.5 | 2.5 |
| 51 | 2.8 | 2.8 |
| 52 | 2.3 | 2.3 |
| 53 | 2.3 | 2.3 |
| 54 | 2.4 | 2.4 |
| 55 | 2.1 | 2.1 |
| 56 | 0.4 | 0.4 |
| 57 | 2.3 | 2.3 |
| 58 | 8.7 | 8.7 |
| 59 | 4.5 | 4.5 |
| 60 | 4.5 | 4.5 |
| 61 | 4.4 | 4.4 |
| 62 | 4.3 | 4.3 |
| 63 | 2.3 | 2.3 |
| 64 | 2.3 | 2.3 |
| 65 | 1.7 | 1.7 |
| 66 | 2.3 | 2.3 |
| 67 | 4.4 | 4.4 |
| 68 | 4.4 | 4.4 |
| 69 | 2.3 | 2.3 |
| 70 | 0 | 0 |
| 71 | 0.3 | 0.3 |
| 72 | 0.2 | 0.2 |
| 73 | 0.2 | 0.2 |
| 74 | 2.3 | 2.3 |
| 75 | 2.5 | 2.5 |
| 76 | 0 | 0 |
| 77 | 2.5 | 2.5 |
| 78 | 0.3 | 0.3 |
| 79 | 0.2 | 0.2 |
| 80 | 0.2 | 0.2 |
| 81 | 2.3 | 2.3 |
| 82 | 0.7 | 0.7 |
| 83 | 0 | 0 |
| 84 | 2.3 | 2.3 |
| 85 | 2.3 | 2.3 |
| 86 | 2.2 | 2.2 |
| 87 | 1.6 | 1.8 |
| 88 | 2.3 | 2.3 |
| 89 | 2.3 | 2.3 |
| 90 | 2.3 | 2.3 |
| 91 | 0 | 0 |
| 92 | 0 | 0 |
| 93 | 0 | 2.4 |
| 94 | 0 | 1.7 |
| 95 | 0 | 0 |
| 96 | 2.4 | 2.4 |
| 97 | 2.7 | 2.3 |
| 98 | 2.5 | 2.3 |
| 99 | 4.9 | 4.9 |
| 100 | 5.0 | 5.0 |
| 101 | 0 | 0 |
| 102 | 0 | 0 |
| 103 | 0 | 0 |
| 104 | 2.3 | 2.3 |
| 105 | 2.3 | 2.3 |
| 106 | 2.3 | 2.3 |
| 107 | 4.9 | 4.9 |
| 108 | 0 | 0 |
| 109 | 0 | 0 |
| 110 | 0 | 0 |
| 111 | 0 | 3.5 |
| 112 | 2.5 | 2.5 |
| 113 | 0.5 | 1.0 |
| 114 | 0 | 0 |
| 115 | 2.5 | 2.5 |
| 116 | 2.5 | 2.5 |
| 117 | 2.5 | 2.5 |
| 118 | 0 | 0 |
| 119 | 2.5 | 2.5 |
| 120 | 0 | 0 |
| Q22 | | |
| E | 1.7 | 1.7 |
| C | 5.0 | 5.0 |
| B | 2.3 | 2.3 |
| Q26 | | |
| E | 0 | 0 |
| C | - | - |
| B | - | - |
| Q32 | | |
| E | 0 | 0 |
| C | 2.0 | 2.0 |
| B | 0 | 0 |
| Q38 | | |
| E | 2.3 | 2.3 |
| C | 5.0 | 5.0 |
| B | 3.0 | 3.0 |
| Q2001 | | |
| E | -10.8 | 0 |
| C | 0 | 0 |
| B | -17.3 | 0.7 |
| Q2002 | | |
| E | -10.8 | 0 |
| C | 0 | 0 |
| B | -17.0 | 0.7 |
| Q2003 | | |
| E | 5.0 | 5.0 |
| C | -17.0 | 4.9 |
| B | 4.9 | 0 |
| Q2051 | | |
| E | 0 | 0 |
| C | 7.5 | 0.3 |
| B | 0.5 | 0.3 |
| Q2052 | | |
| E | 10.8 | 10.9 |
| C | 10.7 | 0.4 |
| B | 10.1 | 10.9 |
| Q2053 | | |
| E | 0 | 0 |
| C | 0 | 10.8 |
| B | 4.9 | 0 |
| Q2054 | | |
| E | 10.7 | 0.4 |
| C | 10.5 | 0.2 |
| B | 9.9 | 0.4 |
| Q2055 | | |
| E | 0 | 0 |
| C | 0 | 0.5 |
| B | 4.9 | 0 |
| Q2251 | | |
| E | 4.9 | 4.9 |
| C | 1.6 | 1.8 |
| B | 4.9 | 4.9 |
| CN1 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 2.2 | 2.3 |
| 6 | 2.2 | 2.3 |
| 7 | 2.2 | 2.3 |
| 8 | 2.2 | 2.3 |
| 9 | 2.7 | 2.3 |
| 10 | 2.7 | 2.3 |
| 11 | 2.7 | 2.3 |
| CN2001 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 2.3 | 2.4 |
| 7 | 2.5 | 2.4 |
| CN2002 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |

**<SYSTEM CONTROL>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| IC3001 | | |
| 1 | - | - |
| 2 | - | - |
| 3 | 0.6 | 0.6 |
| 4 | 0 | 0 |
| 5 | 5.1 | 5.1 |
| 6 | 0 | 0 |
| 7 | 0 | 0 |
| 8 | 0 | 0 |
| 9 | 0 | 0 |
| 10 | 0 | 0 |
| 11 | 0 | 0 |
| 12 | 0 | 5.0 |
| 13 | 5.0 | 5.0 |
| 14 | 0 | 0 |
| 15 | 0 | 5.0 |
| 16 | 4.8 | 4.8 |
| 17 | 4.7 | 4.7 |
| 18 | 4.6 | 4.6 |
| 19 | 0 | 0 |
| 20 | 0 | 0 |
| 21 | 0 | 2.4 |
| 22 | 4.9 | 4.9 |
| 23 | 2.4 | 2.4 |
| 24 | 0 | 0 |
| 25 | - | - |
| 26 | 0 | 2.4 |
| 27 | 5.0 | 0 |
| 28 | 0 | 0 |
| 29 | 0 | 0 |
| 30 | 4.9 | 4.9 |
| 31 | 4.9 | 4.9 |
| 32 | 0 | 0 |
| 33 | 2.6 | 2.6 |
| 34 | 1.1 | 1.3 |
| 35 | 0 | 0 |
| 36 | 4.9 | 4.9 |
| 37 | - | - |
| 38 | - | - |
| 39 | 0 | 0 |
| 40 | - | - |
| 41 | - | - |
| 42 | 4.9 | 4.9 |
| 43 | 5.0 | 5.0 |
| 44 | 0 | 0 |
| 45 | 5.0 | 5.0 |
| 46 | 5.0 | 5.0 |
| 47 | 1.6 | 1.6 |
| 48 | 0 | 0 |
| 49 | 1.6 | 1.6 |
| 50 | 2.4 | 2.4 |
| 51 | 5.0 | 5.0 |
| 52 | 2.4 | 2.4 |
| 53 | 2.5 | 2.5 |
| 54 | 0 | 0 |
| 55 | 0 | 0 |
| 56 | - | - |
| 57 | - | - |
| 58 | 0 | 0 |
| 59 | 0 | 0 |
| 60 | 0 | 0 |
| 61 | 0 | 0 |
| 62 | 4.9 | 4.9 |
| 63 | 4.9 | 4.9 |
| 64 | 0 | 0 |
| 65 | 2.6 | 2.6 |
| 66 | 0.4 | 0.4 |
| 67 | 2.3 | 2.3 |
| 68 | 2.3 | 2.3 |
| 69 | 2.3 | 2.3 |
| 70 | 2.3 | 2.3 |
| 71 | 0 | 0 |
| 72 | 2.3 | 2.3 |
| 73 | 4.8 | 4.8 |
| 74 | 2.8 | 2.3 |
| 75 | 1.9 | 2.3 |
| 76 | 2.3 | 2.3 |
| 77 | 0 | 0 |
| 78 | 0 | 0 |
| 79 | 4.4 | 4.6 |
| 80 | 0 | 0 |
| 81 | 4.9 | 4.9 |
| 82 | 0 | 0 |
| 83 | 0 | 3.4 |
| 84 | 0 | 1.8 |
| 85 | 4.8 | 4.5 |
| 86 | 4.1 | 4.1 |
| 87 | 0 | 0 |
| 88 | 0 | 0 |
| 89 | 0 | 0 |
| 90 | 0 | 0 |
| 91 | 0 | 0 |
| 92 | 4.9 | 0 |
| 93 | 0 | 0 |
| 94 | 4.3 | 4.3 |
| 95 | - | - |
| 96 | - | - |
| 97 | - | - |
| 98 | 5.0 | 5.0 |
| 99 | 5.0 | 5.0 |
| 100 | 5.0 | 5.0 |
| IC3002 | | |
| 1 | 11.4 | 11.4 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0.2 | 0.2 |
| 5 | 11.6 | 11.6 |
| 6 | 11.6 | 11.6 |
| 7 | 0 | 0 |
| 8 | 0 | 0 |
| 9 | 0 | 0 |
| IC3003 | | |
| 1 | 4.9 | 4.9 |
| 2 | 4.9 | 4.9 |
| 3 | 0 | 0 |
| IC3004 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | - | - |
| 6 | - | - |
| 7 | 0 | 0 |
| 8 | 4.9 | 4.9 |
| Q3001 | | |
| E | 0 | 0 |
| C | 4.6 | 4.2 |
| Q3002 | | |
| E | 0 | 0 |
| C | 4.5 | 4.7 |
| Q3003 | | |
| E | 0 | 0 |
| C | 11.4 | 11.4 |
| B | 0.6 | 0.6 |
| Q3004 | | |
| E | 0 | 0 |
| C | 0 | 0 |
| B | 0.7 | 0.7 |
| Q3005 | | |
| E | 0 | 0 |
| C | 0 | 0 |
| B | 0 | 0 |
| Q4001 | | |
| E | 0 | 0 |
| C | 0 | 0 |
| B | 4.4 | 4.4 |
| Q4002 | | |
| E | 4.8 | 4.8 |
| C | 5.8 | 5.8 |
| B | 5.5 | 5.5 |
| Q7201 | | |
| E | 5.1 | 5.1 |
| C | 0 | 0 |
| B | 5.0 | 5.0 |
| CN3001 | | |
| 1 | 0 | 0 |
| 2 | 2.5 | 2.5 |
| 3 | 2.5 | 2.5 |
| 4 | 5.0 | 5.0 |
| 5 | 0 | 0 |
| 6 | 4.9 | 4.9 |
| 7 | - | - |
| 8 | 11.7 | 11.7 |
| CN3002 | | |
| 1 | 11.7 | 11.7 |
| 2 | 0 | 0 |
| 3 | 1.4 | 1.4 |
| 4 | 0.4 | 0.4 |
| 5 | 2.6 | 2.6 |
| CN3003 | | |
| 1 | 0.2 | 0.2 |
| 2 | 0.3 | 0.3 |
| CN3004 | | |
| 1 | 4.9 | 4.9 |
| 2 | 4.9 | 4.9 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| FW3001 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| FW3002 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |

**<SW.REG>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| IC5301 | | |
| 1 | 5.7 | 5.7 |
| 2 | 5.1 | 5.1 |
| 3 | 4.8 | 4.8 |
| 4 | 0 | 0 |
| 5 | 11.5 | 11.5 |
| 6 | 10.9 | 10.9 |
| 7 | 11.6 | 11.6 |
| 8 | 5.7 | 5.7 |
| 9 | 1.3 | 1.3 |
| 10 | 4.4 | 4.4 |
| Q5101 | | |
| D | 87.5 | 85.7 |
| S | - | - |
| G | - | - |
| Q5102 | | |
| E | 0 | 0 |
| C | - | - |
| B | - | - |

**<TUNER/DEMOD>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| IC6501 | | |
| 1 | 8.9 | 8.9 |
| 2 | 4.4 | 4.4 |
| 3 | 4.4 | 4.4 |
| 4 | 4.4 | 4.4 |
| 5 | 4.4 | 4.4 |
| 6 | 4.4 | 4.4 |
| 7 | 4.4 | 4.4 |
| 8 | 4.3 | 4.3 |
| 9 | 5.5 | 5.5 |
| 10 | 3.0 | 3.0 |
| 11 | 3.2 | 3.2 |
| 12 | 4.4 | 4.4 |
| 13 | 4.4 | 4.4 |
| 14 | 0 | 0 |
| 15 | - | - |
| 16 | - | - |
| 17 | 0 | 0 |
| 18 | 4.4 | 4.4 |
| 19 | 4.5 | 4.5 |
| 20 | 4.5 | 4.5 |
| 21 | 1.2 | 1.2 |
| 22 | 5.1 | 5.1 |
| 23 | 5.1 | 5.1 |
| 24 | 4.4 | 4.4 |
| 25 | 4.4 | 4.4 |
| 26 | 4.4 | 4.4 |
| 27 | 4.4 | 4.4 |
| 28 | 3.5 | 3.5 |
| Q6030 | | |
| E | 4.6 | 4.6 |
| C | 0 | 0 |
| B | 4.0 | 4.0 |
| Q6501 | | |
| E | 0 | 0 |
| C | 0 | 0 |
| B | 3.5 | 3.5 |
| Q6502 | | |
| E | 0 | 0 |
| C | 0 | 0 |
| B | 3.5 | 3.5 |
| Q6551 | | |
| E | 8.9 | 8.9 |
| C | 10.9 | 10.9 |
| B | 9.6 | 9.6 |

**<DISPLAY>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| IC7001 | | |
| 1 | 4.9 | 4.9 |
| 2 | 2.1 | 2.1 |
| 3 | 0 | 0 |
| 4 | 2.1 | 2.1 |
| 5 | 4.9 | 4.9 |
| 6 | 4.9 | 4.9 |
| 7 | 4.9 | 4.9 |
| 8 | 4.9 | 4.9 |
| 9 | 4.9 | 4.9 |
| 10 | 4.9 | 4.9 |
| 11 | 4.9 | 4.9 |
| 12 | - | - |
| 13 | 4.3 | - |
| 14 | 4.9 | 4.9 |
| 15 | - | - |
| 16 | -27.8 | -27.8 |
| 17 | -27.8 | -27.8 |
| 18 | -27.5 | -27.5 |
| 19 | -27.5 | -27.5 |
| 20 | -27.5 | -27.5 |
| 21 | -23.4 | -23.4 |
| 22 | - | - |
| 23 | - | - |
| 24 | - | - |
| 25 | - | - |
| 26 | - | - |
| 27 | - | - |
| 28 | - | - |
| 29 | - | - |
| 30 | - | - |
| 31 | - | - |
| 32 | - | - |
| 33 | - | - |
| 34 | - | - |
| 35 | - | - |
| 36 | - | - |
| 37 | - | - |
| 38 | - | - |
| 39 | - | - |
| 40 | - | - |
| 41 | - | - |
| 42 | - | - |
| 43 | - | - |
| 44 | 4.9 | 4.9 |
| IC7002 | | |
| 1 | 5.1 | 5.1 |
| 2 | 5.1 | 5.1 |
| 3 | 0 | 0 |
| CN7001 | | |
| 1 | 5.0 | 5.0 |
| 2 | 5.0 | 5.0 |
| 3 | 5.0 | 5.0 |
| 4 | 5.0 | 5.0 |
| 5 | 5.0 | 5.0 |
| 6 | 5.0 | 5.0 |
| 7 | 0 | 0 |
| 8 | 5.0 | 5.0 |
| 9 | 5.0 | 5.0 |

**<TERMINAL>**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| Q901 | | |
| E | 2.4 | 2.4 |
| C | 0 | 0 |
| B | 1.7 | 1.7 |

**<MINI FRONT>**
**[HR-VP68U/U(C)**
**& VP680U/U(C)]**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| CN7002 | | |
| 1 | 5.0 | 5.0 |
| 2 | 5.0 | 5.0 |
| 3 | 0 | 0 |
| 4 | - | - |
| 5 | - | - |
| 6 | - | - |
| 7 | - | - |
| 8 | - | - |
| 9 | - | - |

**<C.BOX CTL>**
**[HR-VP68U/U(C)**
**& VP780U/U(C)]**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| FW7105 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |

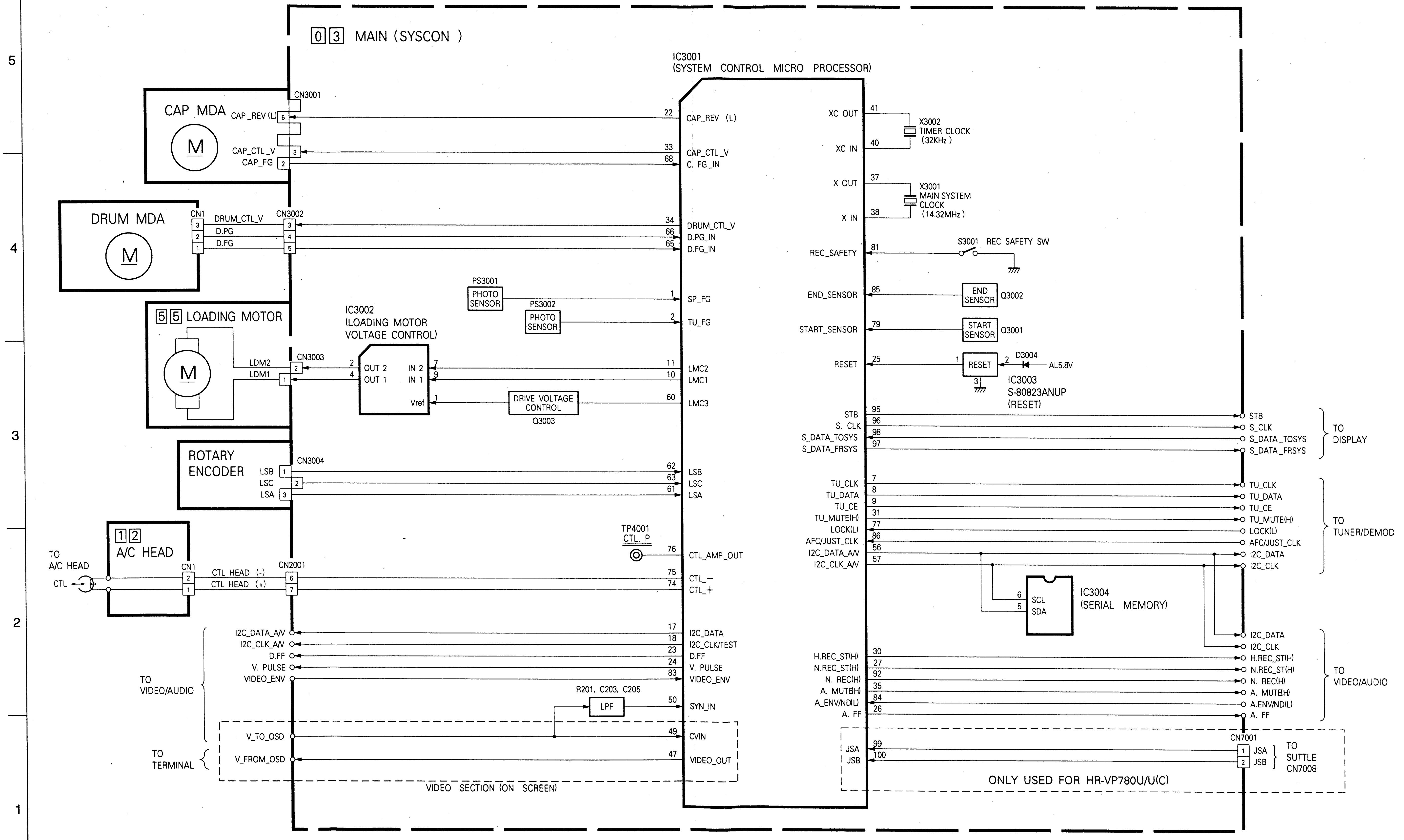
**<R.PAUSE>**
**[HR-VP68U/U(C)**
**& VP780U/U(C)]**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| FW7104 | | |
| 1 | 0 | 0 |
| 2 | 0 | 0 |

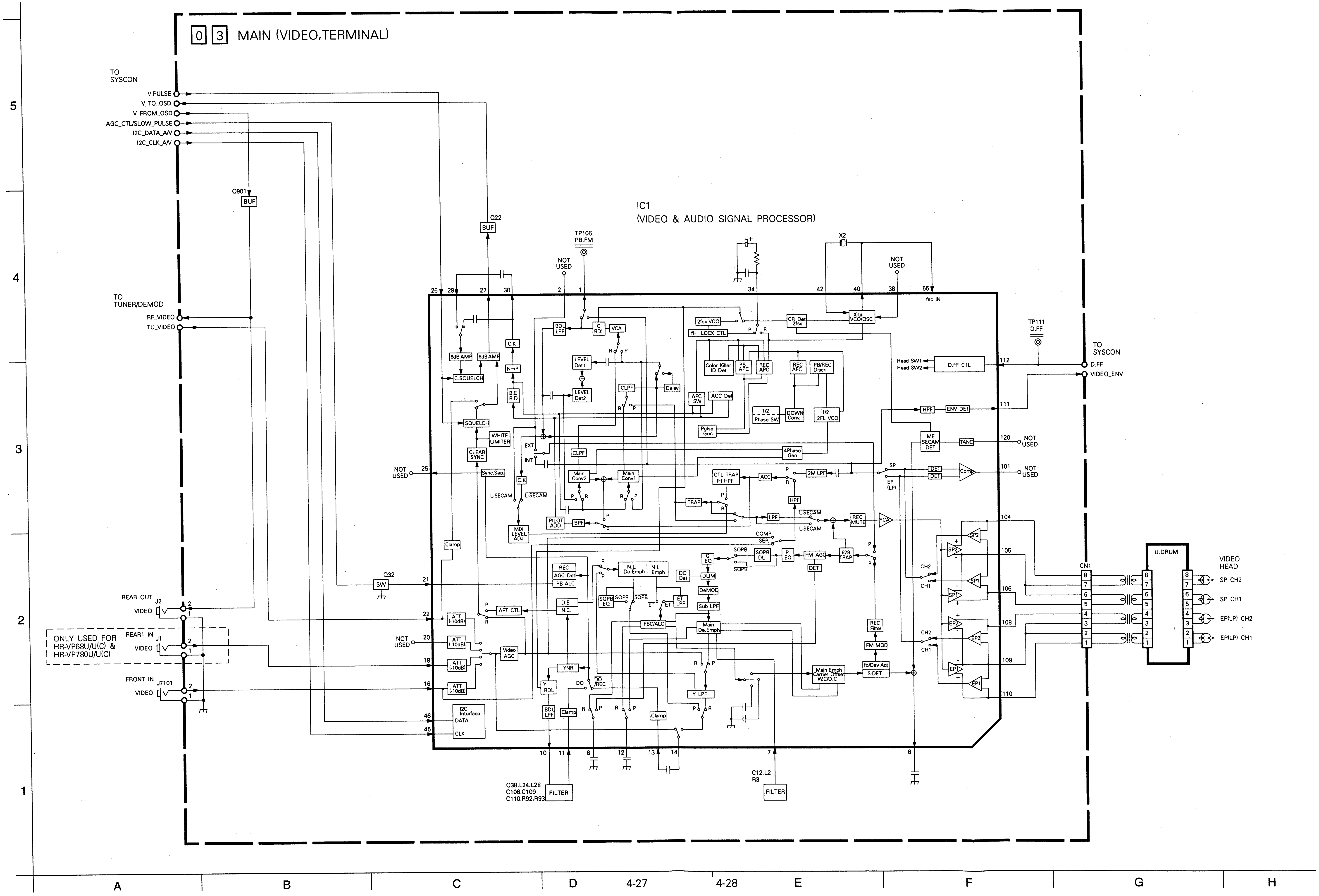
**<SHUTTLE>**
**[HR-VP780U/U(C)]**

| MODE PIN NO. | REC | PLAY |
|---|---|---|
| CN7008 | | |
| 1 | 5.0 | 5.0 |
| 2 | 5.0 | 5.0 |
| 3 | 0 | 0 |
| 4 | 5.0 | 5.0 |
| 5 | 5.0 | 5.0 |
| 6 | 5.0 | 5.0 |
| 7 | 5.0 | 5.0 |
| 8 | 5.0 | 5.0 |
| 9 | 5.0 | 5.0 |

## 4.13 SYSTEM CONTROL BLOCK DIAGRAM

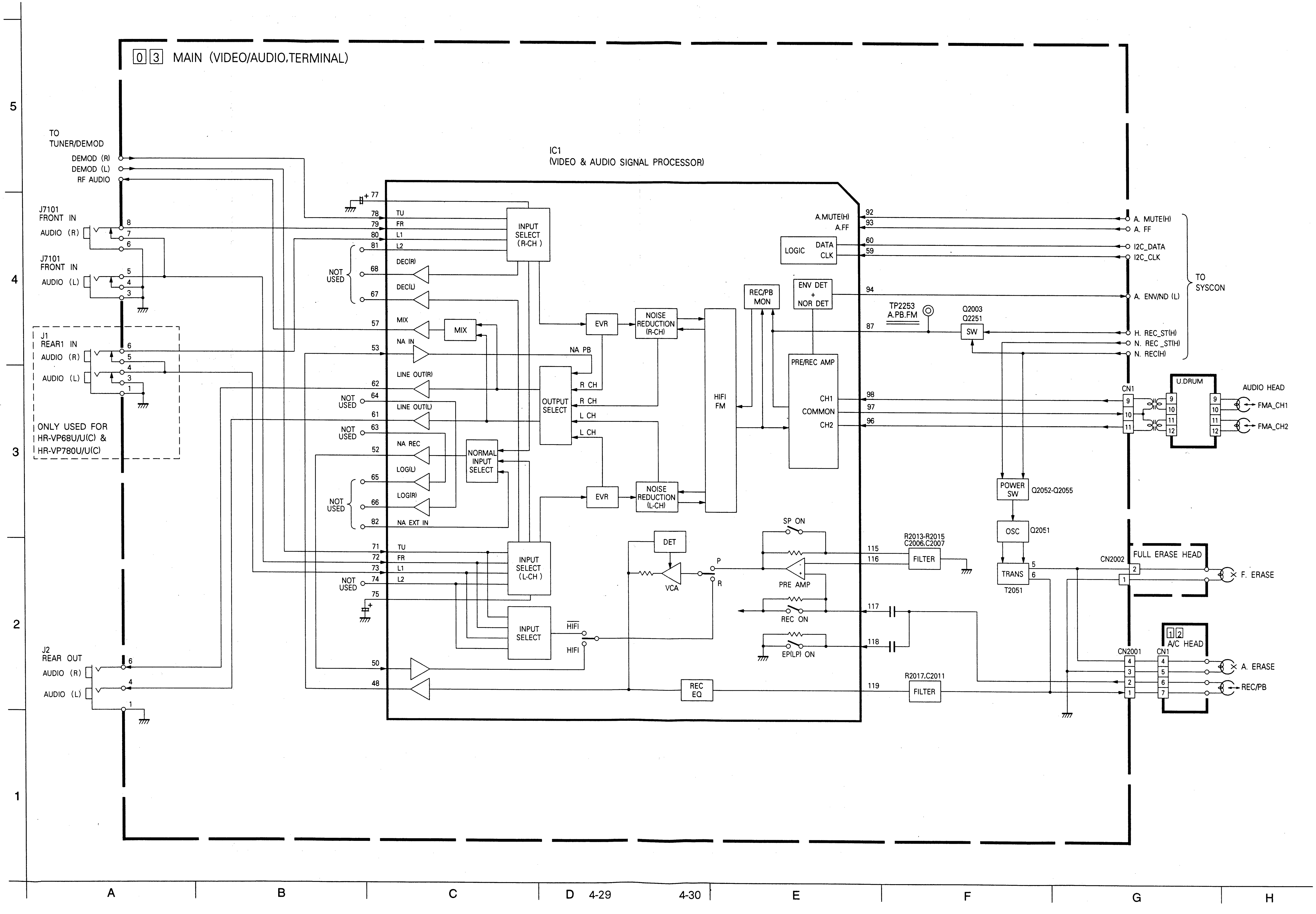

03 MAIN (SYSCON )
IC3001
(SYSTEM CONTROL MICRO PROCESSOR)
CAP MDA
M
CAP_REV (L)
CAP_CTL_V
CAP_FG
CN3001
22 CAP_REV (L)
33 CAP_CTL_V
68 C. FG_IN
DRUM MDA
CN1
DRUM_CTL_V
D.PG
D.FG
CN3002
34 DRUM_CTL_V
66 D.PG_IN
65 D.FG_IN
PS3001 PHOTO SENSOR
1 SP_FG
PS3002 PHOTO SENSOR
2 TU_FG
55 LOADING MOTOR
LDM2
LDM1
CN3003
IC3002
(LOADING MOTOR VOLTAGE CONTROL)
OUT 2
OUT 1
IN 2
IN 1
Vref
11 LMC2
10 LMC1
DRIVE VOLTAGE CONTROL
Q3003
60 LMC3
ROTARY ENCODER
LSB
LSC
LSA
CN3004
62 LSB
63 LSC
61 LSA
TP4001
CTL. P
76 CTL_AMP_OUT
12 A/C HEAD
TO A/C HEAD
CTL
CN1
CTL HEAD (-)
CTL HEAD (+)
CN2001
75 CTL_−
74 CTL_+
TO VIDEO/AUDIO
I2C_DATA_A/V
I2C_CLK_A/V
D.FF
V. PULSE
VIDEO_ENV
17 I2C_DATA
18 I2C_CLK/TEST
23 D.FF
24 V. PULSE
83 VIDEO_ENV
R201, C203, C205
LPF
50 SYN_IN
TO TERMINAL
V_TO_OSD
V_FROM_OSD
49 CVIN
47 VIDEO_OUT
VIDEO SECTION (ON SCREEN)
XC OUT 41
XC IN 40
X3002 TIMER CLOCK (32KHz)
X OUT 37
X IN 38
X3001 MAIN SYSTEM CLOCK (14.32MHz)
REC_SAFETY 81
S3001 REC SAFETY SW
END_SENSOR 85
END SENSOR Q3002
START_SENSOR 79
START SENSOR Q3001
RESET 25
RESET
D3004
AL5.8V
IC3003
S-80823ANUP
(RESET)
STB 95
S. CLK 96
S_DATA_TOSYS 98
S_DATA_FRSYS 97
STB
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
TO DISPLAY
TU_CLK 7
TU_DATA 8
TU_CE 9
TU_MUTE(H) 31
LOCK(L) 77
AFC/JUST_CLK 86
I2C_DATA_A/V 56
I2C_CLK_A/V 57
TU_CLK
TU_DATA
TU_CE
TU_MUTE(H)
LOCK(L)
AFC/JUST_CLK
I2C_DATA
I2C_CLK
TO TUNER/DEMOD
IC3004
(SERIAL MEMORY)
SCL
SDA
H.REC_ST(H) 30
N.REC_ST(H) 27
N. REC(H) 92
A. MUTE(H) 35
A_ENV/ND(L) 84
A. FF 26
I2C_DATA
I2C_CLK
H.REC_ST(H)
N.REC_ST(H)
N. REC(H)
A. MUTE(H)
A.ENV/ND(L)
A. FF
TO VIDEO/AUDIO
JSA 99
JSB 100
CN7001
JSA
JSB
TO SUTTLE CN7008
ONLY USED FOR HR-VP780U/U(C)
5
4
3
2
1

## 4.14 VIDEO BLOCK DIAGRAM



0 3 MAIN (VIDEO,TERMINAL)
TO SYSCON
V.PULSE
V_TO_OSD
V_FROM_OSD
AGC_CTL/SLOW_PULSE
I2C_DATA_A/V
I2C_CLK_A/V
Q901
BUF
Q22
BUF
TO TUNER/DEMOD
RF_VIDEO
TU_VIDEO
IC1
(VIDEO & AUDIO SIGNAL PROCESSOR)
TP106
PB.FM
NOT USED
X2
NOT USED
fsc IN
TP111
D.FF
TO SYSCON
D.FF
VIDEO_ENV
6dB AMP
6dB AMP
C.SQUELCH
C.K
N→P
B.E B.D
BDL LPF
C BDL
VCA
LEVEL Det1
LEVEL Det2
CLPF
Delay
2fsc VCO
fH LOCK CTL
CR Det 2fsc
X-tal VCO/OSC
Color Killer ID Det.
PB APC
REC APC
REC AFC
PB/REC Discri
APC SW
ACC Det
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
Pulse Gen.
4Phase Gen.
Head SW1
Head SW2
D.FF CTL
HPF
ENV DET
ME SECAM DET
TANC
NOT USED
NOT USED
SQUELCH
WHITE LIMITER
CLEAR SYNC
EXT
INT
CLPF
Main Conv2
Main Conv1
Sync.Sep.
C.K
L-SECAM
L-SECAM
CTL TRAP fH HPF
ACC
2M LPF
SP
EP (LP)
DET
DET
Comp
TRAP
HPF
LPF
L-SECAM
L-SECAM
REC MUTE
YCA
PILOT ADD
BPF
MIX LEVEL ADJ
COMP.
SEP.
Clamp
SQPB
SQPB DL
P EQ
FM AGC
629 TRAP
DET
C EQ
REC AGC Det
PB ALC
N.L. De.Emph
N.L. Emph
DO Det
DLIM
DeMOD
SQPB EQ
SQPB
SQPB
ET
ET
ET LPF
Sub LPF
D.E. N.C.
FBC/ALC
Main De.Emph
REC Filter
FM MOD
fo/Dev Adj
S-DET
Main Emph Carrier Offset W.C/D.C
Q32
SW
APT CTL
ATT (-10dB)
ATT (-10dB)
ATT (-10dB)
ATT (-10dB)
Video AGC
YNR
Y BDL
DO
DO /REC
BDL LPF
Clamp
Clamp
Y LPF
I2C Interface
DATA
CLK
SP2
SP2
SP1
SP1
EP2
EP2
EP1
EP1
CH2
CH1
CH2
CH1
CN1
U.DRUM
VIDEO HEAD
SP CH2
SP CH1
EP(LP) CH2
EP(LP) CH1
REAR OUT
J2
VIDEO
REAR1 IN
J1
VIDEO
FRONT IN
J7101
VIDEO
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
NOT USED
NOT USED
Q38.L24.L28
C106.C109
C110.R92.R93
FILTER
C12.L2
R3
FILTER
26
29
27
30
2
1
34
42
40
38
55
112
111
120
101
104
105
106
108
109
110
25
21
22
20
18
16
46
45
10
11
6
12
13
14
7
8
5
4
3
2
1
A
B
C
D
E
F
G
H

## 4.15 AUDIO BLOCK DIAGRAM


0 3 MAIN (VIDEO/AUDIO,TERMINAL)
TO TUNER/DEMOD
DEMOD (R)
DEMOD (L)
RF AUDIO
J7101 FRONT IN
AUDIO (R)
J7101 FRONT IN
AUDIO (L)
J1 REAR1 IN
AUDIO (R)
AUDIO (L)
ONLY USED FOR HR-VP68U/U(C) & HR-VP780U/U(C)
J2 REAR OUT
AUDIO (R)
AUDIO (L)
IC1 (VIDEO & AUDIO SIGNAL PROCESSOR)
TU
FR
L1
L2
INPUT SELECT (R-CH)
DEC(R)
DEC(L)
NOT USED
MIX
NA IN
NA PB
LINE OUT(R)
LINE OUT(L)
OUTPUT SELECT
R CH
L CH
NA REC
LOG(L)
LOG(R)
NORMAL INPUT SELECT
NA EXT IN
INPUT SELECT (L-CH)
INPUT SELECT
HIFI
EVR
NOISE REDUCTION (R-CH)
NOISE REDUCTION (L-CH)
HIFI FM
REC/PB MON
ENV DET + NOR DET
PRE/REC AMP
CH1
COMMON
CH2
LOGIC
DATA
CLK
A.MUTE(H)
A.FF
DET
VCA
P
R
SP ON
PRE AMP
REC ON
EP(LP) ON
REC EQ
TP2253 A.PB.FM
Q2003 Q2251
SW
R2013-R2015 C2006,C2007
FILTER
R2017,C2011
FILTER
POWER SW
Q2052-Q2055
OSC
Q2051
TRANS
T2051
A. MUTE(H)
A. FF
I2C_DATA
I2C_CLK
A. ENV/ND (L)
H. REC_ST(H)
N. REC_ST(H)
N. REC(H)
TO SYSCON
CN1
U.DRUM
AUDIO HEAD
FMA_CH1
FMA_CH2
CN2002
FULL ERASE HEAD
F. ERASE
CN2001
1 2 A/C HEAD
A. ERASE
REC/PB
77 78 79 80 81 68 67 57 53 62 64 61 63 52 65 66 82 71 72 73 74 75 50 48
92 93 60 59 94 87 98 97 96 115 116 117 118 119
5 4 3 2 1
A B C D E F G H

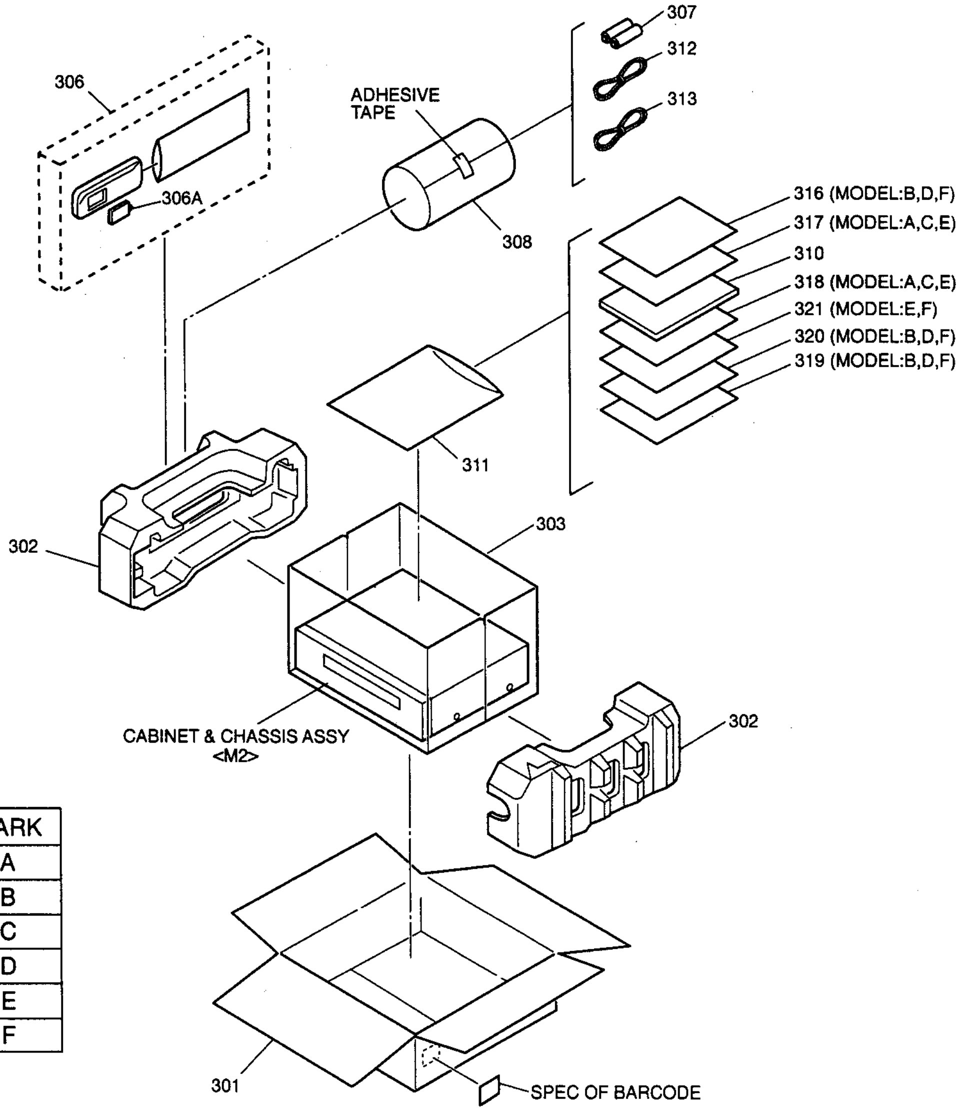
# SECTION 5
# PARTS LIST

## SAFETY PRECAUTION

**Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.**

### 5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

**The instruction manual to be provided with this product will differ according to the destination.**


307
312
313
306
ADHESIVE TAPE
306A
308
316 (MODEL:B,D,F)
317 (MODEL:A,C,E)
310
318 (MODEL:A,C,E)
321 (MODEL:E,F)
320 (MODEL:B,D,F)
319 (MODEL:B,D,F)
311
303
302
CABINET & CHASSIS ASSY <M2>
302
301
SPEC OF BARCODE

| MODEL | MARK |
|---|---|
| HR-VP68U | A |
| HR-VP68U(C) | B |
| HR-VP680U | C |
| HR-VP680U(C) | D |
| HR-VP780U | E |
| HR-VP780U(C) | F |

********************************

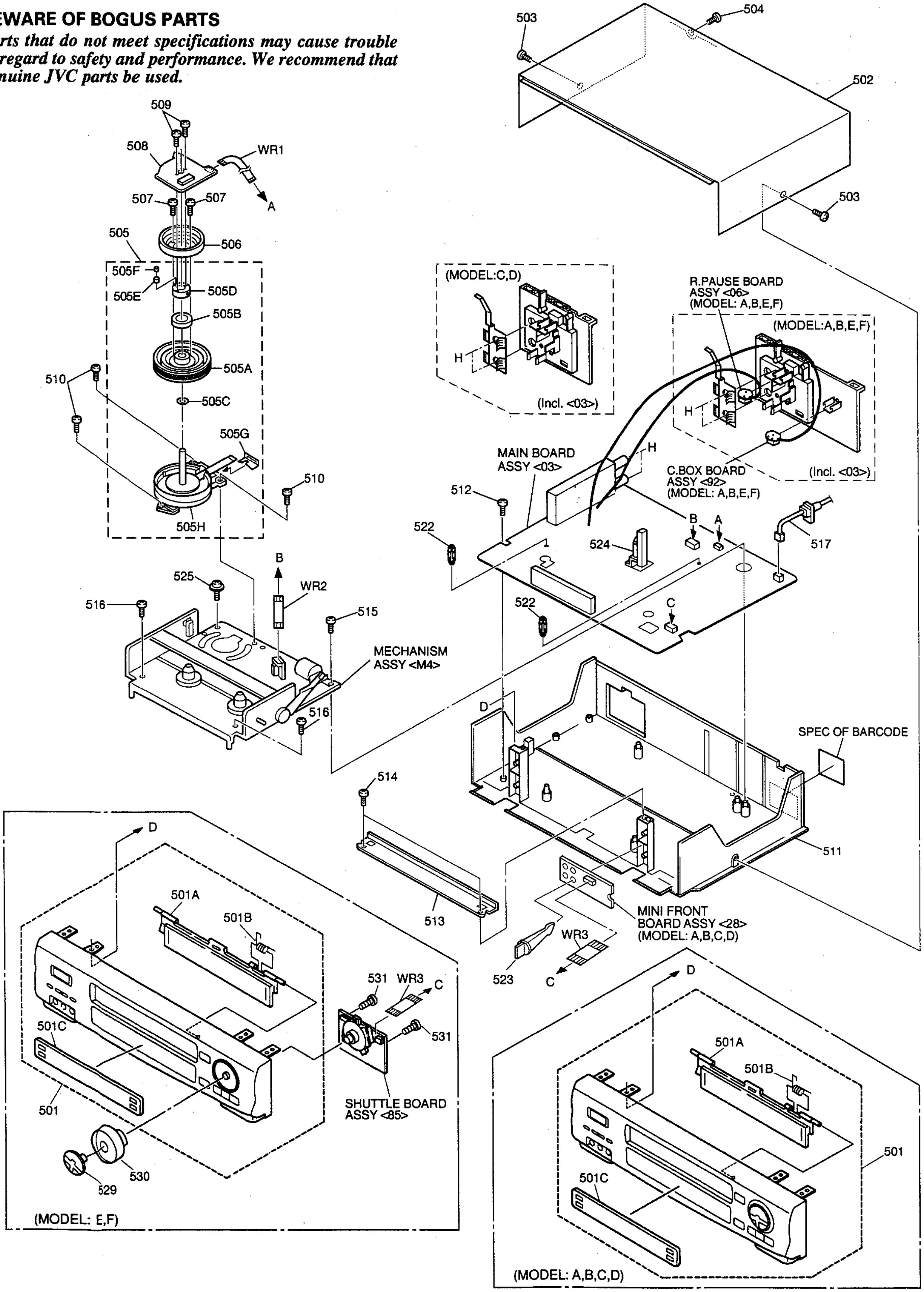
## PACKING AND ACCESSORY ASSEMBLY <M1>

| # ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | 301 | LP30658-001A | PACKING CASE,E.F |
| | | LP30658-007A | PACKING CASE,C.D |
| | | LP30670-005A | PACKING CASE,A |
| | | LP30708-007A | PACKING CASE,B |
| | 302 | LP30718-001A | CUSHION ASSY,C.D.E.F |
| | | LP30671-001C | CUSHION ASSY,A.B |
| | 303 | PQM30021-92 | POLY BAG,A.B |
| | | PQM30021-93 | POLY BAG,C.D.E.F |
| | 306 | LP20303-014A | REMOTE CONTROLLER,C.D |
| | | LP20303-015A | REMOTE CONTROLLER,A.B.E.F |
| | 306A | LP40225-002A | COVER(BATTERY) |
| | 307 | – | BATTERY,X2("R6"TYPE) |
| | 308 | QPC02202230P | POLY BAG |
| ⚠ | 310 | LPT0313-003A | INST.BOOK(FR),F |
| ⚠ | | LPT0342-001A | INST.BOOK(EN),C.D |
| ⚠ | | LPT0342-003A | INST BOOK(FR),D |
| ⚠ | | LPT0345-001A | INST.BOOK(EN),A.B |
| ⚠ | | LPT0345-003A | INST.BOOK(FR),B |
| ⚠ | | LPT0313-001B | INST.BOOK(EN),E,F |
| | 311 | QPC02503530P | POLY BAG |
| | 312 | PEAC0294-04 | RF CABLE |
| | 313 | QAL0095-005 | LED CABLE ASSY,A.B |
| | 316 | BT-52004-1 | WARRANTY CARD,B.D.F |
| | 317 | BT-51020-2 | REGIST.CARD,A.C.E |
| | 318 | LPT0313-002A | Q.S.SHEET,E |
| | | LPT0342-002A | Q.S.SHEET,C |
| | | LPT0345-002A | Q.S.SHEET,A |
| | 319 | BT-20071B | SER.NET CARD,B.D.F |
| | 320 | PU36560 | CONECTION SHEET,B.D.F |
| | 321 | LP30666-001B | SHEET(COUPON),E.F |

## 5.2 CABINET AND CHASSIS ASSEMBLY <M2>

### BEWARE OF BOGUS PARTS

***Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.***


503
504
502
503
509
508
WR1
A
507
507
505
506
505F
505E
505D
505B
505A
510
505C
505G
510
505H
(MODEL:C,D)
H
(Incl. <03>)
R.PAUSE BOARD ASSY <06> (MODEL: A,B,E,F)
(MODEL:A,B,E,F)
H
C.BOX BOARD ASSY <92> (MODEL: A,B,E,F)
(Incl. <03>)
MAIN BOARD ASSY <03>
H
512
522
B
A
524
517
B
525
WR2
516
515
522
C
MECHANISM ASSY <M4>
D
516
SPEC OF BARCODE
514
511
D
501A
501B
513
MINI FRONT BOARD ASSY <28> (MODEL: A,B,C,D)
WR3
523
C
531
WR3
C
531
501C
501
SHUTTLE BOARD ASSY <85>
530
529
(MODEL: E,F)
D
501A
501B
501
501C
(MODEL: A,B,C,D)

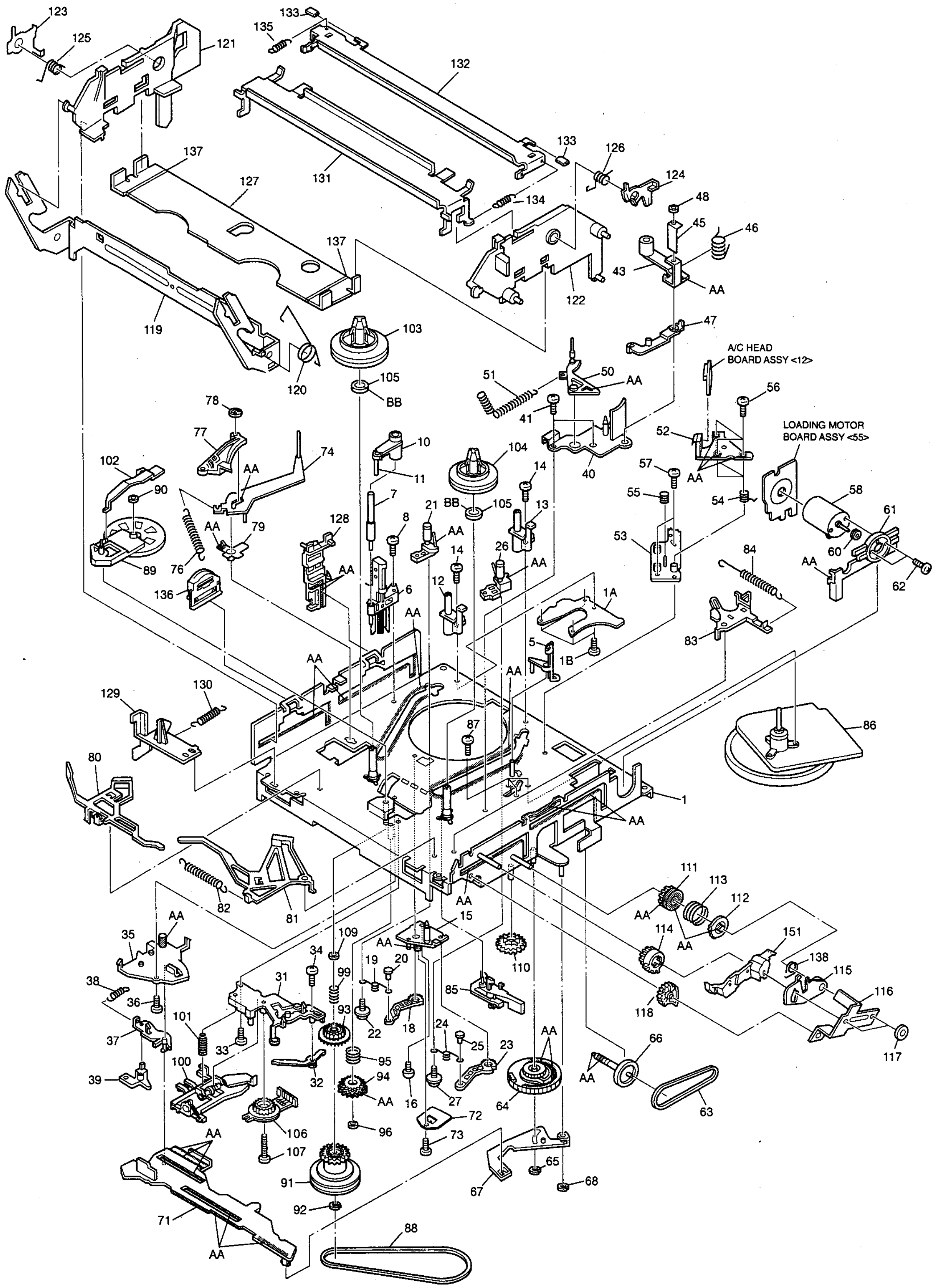
******************************

## CABINET AND CHASSIS ASSEMBLY <M2>

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|---|
|  | ⚠ | 501 | LP10289-001A | FRONT PANEL ASSY,E.F |
|  | ⚠ |  | LP10289-006A | FRONT PANEL ASSY,C.D |
|  | ⚠ |  | LP10293-003C | FRONT PANEL ASSY,A.B |
|  |  | 501A | LP20868-001A | CASSETTE DOOR,C.D.E.F |
|  |  |  | LP20868-003A | CASSETTE DOOR,A.B |
|  |  | 501B | PQ46448 | TORSION SPRING |
|  |  | 501C | LP20869-001A | DISPLAY WINDOW,E.F |
|  |  |  | LP20869-006A | DISPLAY WINDOW,C.D |
|  |  |  | LP20869-015A | DISPLAY WINDOW,A.B |
|  | ⚠ | 502 | LP10013-021C | TOP COVER,C.D.E.F |
|  | ⚠ |  | PQ11898-26-18 | TOP COVER,A.B |
|  |  | 503 | QYTDSF3010M | SCREW,X2 TOP COVER(SIDE) |
|  |  | 504 | QYTDSF3010M | SCREW,TOP COVER(REAR) |
|  |  | 505 | LP20617-001A | DRUM SUB ASSY |
|  |  | 505A | LP20616-001A | UPPER DRUM ASSY |
|  |  | 505B | PDM4439 | CAP |
|  |  | 505C | PDM4444-19-2 | WASHER |
|  |  | 505D | LP40572-001A | COLLAR ASSY |
|  |  | 505E | LP40323-001A | CONTACT |
|  |  | 505F | LP30004-014A | COMPRESSION SPRING |
|  |  | 505G | LP40174-001B | FPC PLATE |
|  |  | 505H | LP20615-001A | LOWER DRUM ASSY |
|  |  | 506 | PDZ0179-1-4 | ROTOR ASSY |
|  |  | 507 | QYSPSP3006Z | SCREW,X2 |
|  | ⚠ | 508 | QAR0119-001 | STATOR ASSY |
|  |  | 509 | QYSPSPH2606Z | SCREW,X2 |
|  |  | 510 | QYTDST2610Z | SCREW,X3 DRUM |
|  | ⚠ | 511 | LP10108-010A | BOTTOM CHASSIS,E.F |
|  | ⚠ |  | LP10108-011A | BOTTOM CHASSIS,C.D |
|  | ⚠ |  | LP20262-010A | BOTTOM CHASSIS,A.B |
|  |  | 512 | QYTDSF3010Z | SCREW,MAIN |
|  |  | 513 | LP30312-001B | BRACKET(CHASSIS) |
|  |  | 514 | QYTDSF3010Z | SCREW,X2 |
|  |  | 515 | QYTDSF4012Z | SCREW,MECHA |
|  |  | 516 | QYTDSF3010Z | SCREW,X2 MECHA |
|  | ⚠ | 517 | QMPD190-170-K | POWER CORD |
|  |  | 522 | LP40226-001A | PC SUPPORT,X2 |
|  |  | 523 | LP40628-001A | PC SUPPORT,A.B.C.D |
|  |  | 524 | LP40253-001B | STOPPER |
|  |  | 525 | PQ40413 | SPECIAL SCREW,MECHA |
|  |  | 529 | LP30651-001A | KNOB(JOG),E.F |
|  |  | 530 | LP30652-001A | KNOB(SHUTTLE),E.F |
|  |  | 531 | QYTDSF2608Z | SCREW,X2 JOG,E.F |
|  |  | WR1 | QUQ212-0518CG | FFC WIRE,DRUM CN3002 |
|  |  | WR2 | WJT0005-002A | E-CARD WIRE,A/C HEAD CN2001 |
|  |  | WR3 | QUQ112-0914CG | FFC WIRE,FRONT CN7001 |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|---|---|

## 5.3 MECHANISM ASSEMBLY <M4>


123
133
135
125
121
132
133
126
137
124
127
131
134
48
45
46
137
43
AA
122
119
103
47
A/C HEAD BOARD ASSY <12>
120
105
BB
51
50
AA
56
78
41
52
LOADING MOTOR BOARD ASSY <55>
77
74
10
104
40
102
AA
11
14
57
AA
90
7
21
BB
105
13
55
54
58
8
128
AA
AA
79
76
89
AA
12
14
26
AA
53
84
61
60
AA
62
136
AA
6
1A
AA
5
1B
83
AA
AA
129
130
87
86
80
1
AA
111
113
112
AA
AA
82
81
15
35
AA
109
AA
114
AA
151
34
19
20
110
138
115
99
31
38
36
85
116
93
101
22
18
118
24
25
23
AA
37
33
95
66
100
94
117
39
32
AA
AA
64
16
27
72
63
96
106
73
AA
107
65
91
67
68
92
71
88
AA

| Classifi-cation | Part No. | Symbol in drawing |
|---|---|---|
| Grease | KYODO-SH-P | AA |
| Oil | COSMO-HV56 | BB |

**NOTE:** The section marked in AA and BB indicate lubrication and greasing areas.

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## MECHANISM ASSEMBLY <M4>

| # ⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| 1 | LP20228-008H | MAIN DECK ASSY |
| 1A | LP40275-003A | PLATE(SUPPLY) |
| 1B | QYTDST2606Z | SCREW,X4 PLATE(SUPPLY) |
| 5 | LP30492-002B | GUIDE POLE GUARD |
| 6 | NAH0001-001 | FULL ERASE HEAD |
| 7 | LP40098-001B | GUIDE POLE(SUPPLY) |
| 8 | QYTDST2608Z | SCREW,FE HEAD |
| 10 | LP30459-002A | TENSION STUD BASE |
| 11 | LP40367-002A | TENSION STUD |
| 12 | LP30409-002C | UV CATCHER 2(SUPPLY) |
| 13 | LP30409-002C | UV CATCHER 2(TAKE UP) |
| 14 | QYTPST2606Z | SCREW,X2 UV CATCHER |
| 15 | LP30223-003C | LOADING ARM GEAR SHAFT |
| 16 | QYTDST2606Z | SCREW |
| 18 | LP30224-001A | LOADING ARM GEAR(SPPLY) |
| 19 | LP40099-001A | TORSION ARM |
| 20 | LP40100-001A | PIN |
| 21 | LP40101-002C | POLE BASE ASSY(SUPPLY) |
| 22 | QYSPSTG2606Z | SCREW |
| 23 | LP40103-002B | LOADING ARM GEAR(TAKE UP) |
| 24 | LP40099-001A | TORSION ARM |
| 25 | LP40100-001A | PIN |
| 26 | LP40104-003A | POLE BASE ASSY(TAKE UP) |
| 27 | QYSPSTG2606Z | SCREW |
| 31 | LP20233-004B | ROTARY ENCODER GUIDE |
| 32 | LP30499-001C | BRAKE LEVER |
| 33 | QYTPST2606Z | SCREW |
| 34 | QYTPST2608Z | SCREW |
| 35 | LP30226-004C | CONTROL PLATE GUIDE |
| 36 | QYTPST2605Z | SCREW |
| 37 | LP30249-003B | TAKE UP LEVER |
| 38 | LP30003-006A | TENSION SPRING |
| 39 | LP40119-002A | T.UP HEAD |
| 40 | LP20234-004B | LID GUIDE |
| 41 | QYTDST2606Z | SCREW,X2 |
| 43 | LP40105-001B | PINCH ROLLER ARM ASSY |
| 45 | LP40478-001A | PINCH ROLLER SHEET2 |
| 46 | LP40148-002A | TORSION SPRING |
| 47 | LP40149-001B | P.LEVER ASSY |
| 48 | LP30016-002A | SLIT WASHER |
| 50 | LP40106-002E | GUIDE ARM ASSY |
| 51 | LP40134-001C | TENSION SPRING |
| 52 | QAH0010-004 | AC HEAD |
| 53 | LP30228-001A | HEAD BASE |
| 54 | LP30004-013A | COMPRESSION SPRING,X3 |
| 55 | LP40236-001A | COMPRESSION SPRING |
| 56 | LP40213-002B | SPECIAL SCREW,X3 |
| 57 | QYTDST2608Z | SCREW,X2 |
| 58 | QAR0023-001 | LOADING MOTOR |
| 60 | PQ43546-1-2 | MOTOR PULLEY |
| 61 | LP30230-003A | MOTOR GUIDE |
| 62 | QYTPSP3003Z | SCREW,X2 |
| 63 | LP30005-003A | BELT,LOADING MOTOR |
| 64 | LP20791-002B | CONTROL CAM |
| 65 | PQM30017-24 | SLIT WASHER |
| 66 | LP40120-001A | WORM GEAR |
| 67 | LP40107-002A | LINK LEVER ASSY |
| 68 | PQM30017-24 | SLIT WASHER |
| 71 | LP10201-003B | CONTROL PLATE |
| 72 | LP40379-001B | CTL BRACKET(1) |
| 73 | QYTDSF2608M | SCREW |
| 74 | LP40108-002A | TENSION ARM ASSY |
| 76 | LP30003-010A | TENSION SPRING |
| 77 | LP40109-003D | TENSION BRAKE ASSY |
| 78 | PQ46302-1-3 | ADJUST PIN |
| 79 | LP30232-002A | T.ARM BEARING |
| 80 | LP40532-008A | MAIN BRAKE ASSY (SUPPLY) |
| 81 | LP40111-011A | MAIN BRAKE ASSY (TAKE-UP) |
| 82 | LP30003-026A | TENSION SPRING |
| 83 | LP40112-001F | SUB BRAKE ASSY(TAKE UP) |
| 84 | LP40357-002A | TENSION SPRING |
| 85 | LP40461-001A | CAPSTAN BRAKE ASSY |
| 86 | QAR0087-004 | CAPSTAN MOTOR |
| 87 | QYTDSF2606M | SCREW,X3 |
| 88 | LP30005-007A | BELT,CAPSTAN MOTOR |
| 89 | LP40114-008A | IDLER ARM ASSY |
| 90 | LP30016-001A | SLIT WASHER |
| 91 | LP40593-001A | CLUTCH UNIT 3 |
| 92 | PQM30017-47 | SLIT WASHER |
| 93 | LP40446-002B | CLUTCH GEAR 1 |
| 94 | LP40442-001A | DIRECT GEAR |
| 95 | LP40483-002A | COMPRESSION SPRING |
| 96 | LP30016-001A | SLIT WASHER |
| 99 | LP40554-001A | COMPRESSION SPRING |
| 100 | LP40484-001H | CHANGE LEVER ASSY |
| 101 | LP40512-002B | COMRESSION SPRING |
| 103 | LP40420-001A | REEL DISK (SUPPLY) |
| 104 | LP40421-001A | REEL DISK (TAKE-UP) |
| 105 | LP30017-015A | SPACER,X2 |
| 106 | QSW0554-003 | ROTARY ENCODER |
| 107 | QYTPST2620Z | SCREW,ROTARY ENCODER |
| 109 | LP30017-019A | SPACER,C.GEAR 1 |
| 110 | LP30237-002B | CASSETTE GEAR |
| 111 | LP30239-002G | LIMIT GEAR(1) |
| 112 | LP30240-002G | LIMIT GEAR(2) |
| 113 | LP40136-001E | TORSION SPRING |
| 114 | LP30242-002A | RELAY GEAR |
| 115 | LP30339-002E | OPENER GUIDE |
| 116 | LP40214-001B | C.H.BRACKET |
| 117 | PQM30017-47 | SLIT WASHER,X2 |
| 118 | LP30243-001D | DRIVE GEAR |
| 119 | LP20240-001D | DRIVE ARM |
| 120 | LP40137-001A | TORSION SPRING |
| 121 | LP10081-002L | SIDE HOLDER(L) |
| 122 | LP10082-002M | SIDE HOLDER(R) |
| 123 | LP30255-006A | LOCK LEVER(L) |
| 124 | LP30256-001H | LOCK LEVER(R) |
| 125 | LP40168-001A | TORSION SPRING(L) |
| 126 | LP40218-001B | TORSION SPRING(R) |
| 127 | LP30257-001F | CASSETTE HOLDER |
| 128 | LP30244-002G | GUIDE RAIL |
| 129 | LP30245-002E | REC SAFETY LEVER |
| 130 | LP30003-004A | TENSION SPRING |
| 131 | LP20578-001C | TOP GUIDE |
| 132 | LP30500-001C | HOLD PLATE |
| 133 | LP40450-003A | PAD,X2 HOLD PLATE |
| 134 | LP30003-025B | TENSION SPRING |
| 135 | LP30003-024A | TENSION SPRING |
| 136 | LP40481-003A | ROLLER CAM ASSY |
| 137 | LP30019-014A | PAD,X2 CASSETTE HOLDER |
| 138 | LP40545-001A | TORSION SPRING,OPENER GUIDE |
| 151 | LP20324-003A | DOOR OPENER |

## 5.4 ELECTRICAL PARTS LIST

| MODEL | MARK | MODEL | MARK |
|---|---|---|---|
| HR-VP68U | A | HR-VP680U(C) | D |
| HR-VP68U(C) | B | HR-VP780U | E |
| HR-VP680U | C | HR-VP780U(C) | F |

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### MAIN BOARD ASSEMBLY <03>

| # ⚠ REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| PW1 | LPA10088-01D1 | MAIN BOARD ASSY,E.F |
|  | LPA10088-05C1 | MAIN BOARD ASSY,C.D |
|  | LPA10088-06C1 | MAIN BOARD ASSY,A.B |
| IC1 | JCP8020-NVA | IC |
| IC3001 | MN101D02GJK | IC |
|  | or MN101DP02JAFJK | IC |
| IC3002 | BA6956AN | IC |
| IC3003 | S-80823ANUP-W | IC |
|  | or R3111H231A | IC |
| IC3004 | M24C04-BN6 | IC |
|  | or AT24C04-10PC | IC |
|  | or 24LC04B/P | IC |
| IC5301 | LA5613 | IC |
| IC6501 | UPC1854AGT | IC |
| IC7001 | M35500BGP | IC |
|  | or M35500AGP | IC |
| IC7002 | GP1U291Q | IR DETECT UNIT |
|  | or PNA4652M00YC | IR DETECT UNIT |
|  | or PIC-28143LJ | IR DETECT UNIT |
| Q22 | 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2SD1819A/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
| Q26 | DTC144WU | TRANSISTOR |
|  | or PDTC144WU | TRANSISTOR |
|  | or RN1309 | TRANSISTOR |
|  | or UN521E | TRANSISTOR |
| Q32 | DTC144WU | TRANSISTOR |
|  | or RN1309 | TRANSISTOR |
|  | or UN521E | TRANSISTOR |
|  | or PDTC144WU | TRANSISTOR |
| Q38 | 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
|  | or 2SD1819A/QRS/-X | TRANSISTOR |
| Q901 | 2SA1576A/QRS/-X | TRANSISTOR |
|  | or 2PA1576/R/-X | TRANSISTOR |
| Q2001 | 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
|  | or 2SD1819A/QRS/-X | TRANSISTOR |
| Q2002 | 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2SD1819A/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
| Q2003 | DTA144WU | TRANSISTOR |
|  | or PDTA144WU | TRANSISTOR |
|  | or UN511E | TRANSISTOR |
|  | or RN2309 | TRANSISTOR |
| Q2051 | 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
|  | or 2SD1819A/QRS/-X | TRANSISTOR |
| Q2052 | 2SA1576A/QR/-X | TRANSISTOR |
|  | or 2SB1218A/QR/-X | TRANSISTOR |
|  | or 2PA1576/R/-X | TRANSISTOR |
| Q2053 | DTC144WU | TRANSISTOR |
|  | or PDTC144WU | TRANSISTOR |
|  | or RN1309 | TRANSISTOR |
|  | or UN521E | TRANSISTOR |
| Q2054 | 2SA1576A/QR/-X | TRANSISTOR |
|  | or 2PA1576/R/-X | TRANSISTOR |
|  | or 2SB1218A/QR/-X | TRANSISTOR |
| Q2055 | DTC144WU | TRANSISTOR |
|  | or PDTC144WU | TRANSISTOR |
|  | or RN1309 | TRANSISTOR |
|  | or UN521E | TRANSISTOR |
| Q2251 | DTA144WU | TRANSISTOR |
|  | or PDTA144WU | TRANSISTOR |
|  | or RN2309 | TRANSISTOR |
|  | or UN511E | TRANSISTOR |
| Q3001 | PTZ-NV16A | IC(PHOTO COUPLE) |
| Q3002 | PTZ-NV16A | IC(PHOTO COUPLE) |
| Q3003 | 2SD1819A/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
|  | or 2SC4081/QRS/-X | TRANSISTOR |
| Q3004 | 2SD1819A/QRS/-X | TRANSISTOR |
|  | or 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
| Q3005 | UN521K | TRANSISTOR,A.B.E.F |
|  | or DTC114WU | TRANSISTOR,A.B.E.F |
| Q4001 | UN5211 | TRANSISTOR |
|  | or PDTC114EU | TRANSISTOR |
|  | or RN1302 | TRANSISTOR |
|  | or DTC114EU | TRANSISTOR |
| Q4002 | 2SD1819A/QRS/-X | TRANSISTOR |
|  | or 2SC4081/QRS/-X | TRANSISTOR |
|  | or 2PC4081/R/-X | TRANSISTOR |
| Q5101 | 2SK3048-LT | POWER MOS FET,E.F |
|  | or 2SK3048 | POWER MOS FET,E.F |
|  | or 2SK2325 | POWER MOS FET,E.F |
|  | or 2SK2325-LT | POWER MOS FET,E.F |
| Q5102 | 2SD2144S/UV/-T | TRANSISTOR |
| Q6030 | 2SB1218A/QR/-X | TRANSISTOR |
|  | or 2SA1576A/QR/-X | TRANSISTOR |
|  | or 2PA1576/R/-X | TRANSISTOR |
| Q6501 | DTC143TU | TRANSISTOR |
| Q6502 | DTC143TU | TRANSISTOR |
| Q6551 | 2SC1740S/QRS/-T | TRANSISTOR |
|  | or 2SC3199/YG/-T | TRANSISTOR |
| Q7201 | 2SA720/RS/-T | TRANSISTOR,A.B.E.F |
| D1 | 1SS133 | DIODE |
|  | or 1SS270A | DIODE |
| D2 | 1SS133 | DIODE |
|  | or 1SS270A | DIODE |
| D4 | 1SS133 | DIODE |
|  | or 1SS270A | DIODE |
| D5 | 1SS133 | DIODE |
|  | or 1SS270A | DIODE |
| D2201 | 11ES2 | DIODE |
| D2202 | MTZJ9.1B | ZENER DIODE |
| D3001 | LNB2301L01VI | LE DIODE |
| D3002 | 1SS133 | DIODE |
|  | or 1SS270A | DIODE |
| D3004 | 11ES2 | DIODE |
| D3005 | 11ES2 | DIODE |
| D3006 | RD33ES/B2/-T2 | ZENER DIODE |
|  | or MTZJ33B | ZENER DIODE |
| D3007 | 1SS355 | DIODE,A.B.E.F |
| D3009 | DA204U | DIODE |
| D3013 | DA204U | DIODE |
| D3015 | DAN202U | DIODE |
| D4003 | 1SS133 | DIODE |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|
| | | | or 1SS270A | DIODE | |
| | | D5001 | S1WB(A)60F4102 | BRIDGE DIODE | |
| | | | or S1WB(A)60F4072X | BRIDGE DIODE | |
| | | | or S1WB(A)60F4062X | BRIDGE DIODE | |
| | | D5101 | AU01 | FR DIODE | |
| | | | or ERA18-04-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 10ELS4 | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | D5102 | AU01 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 10ELS4 | FR DIODE | |
| | | | or ERA18-04-T2 | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | D5103 | 1SS133 | DIODE | |
| | | | or 1SS270A | DIODE | |
| | | D5201 | AU01Z | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | | D5203 | AU01Z | FR DIODE | |
| | | | or ERA18-02-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | D5204 | AU01Z | FR DIODE | |
| | | | or ERA18-02-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | | D5205 | AU01Z | FR DIODE | |
| | | | or ERA18-02-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | ⚠ | D5207 | AK04 | DIODE | |
| | ⚠ | | or 1S4 | SB DIODE | |
| | ⚠ | | or 11EQS04 | SB DIODE | |
| | | D5210 | AU01Z | FR DIODE | |
| | | | or ERA18-02-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | D5211 | AU01Z | FR DIODE | |
| | | | or ERA18-02-T2 | FR DIODE | |
| | | | or PG104RS | FR DIODE | |
| | | | or 10ELS2 | FR DIODE | |
| | | | or 1SR153-400-T2 | FR DIODE | |
| | | D5301 | MTZJ15A | ZENER DIODE | |
| | | | or RD15ES/B1/-T2 | ZENER DIODE | |
| | | D5302 | MTZJ6.8A | ZENER DIODE | |
| | | | or RD6.8ES/B1/-T2 | ZENER DIODE | |
| | | D5303 | MTZJ27C | ZENER DIODE | |
| | | | or RD27ES/B3/-T2 | ZENER DIODE | |
| | | D5304 | 1SS133 | DIODE | |
| | | | or 1SS270A | DIODE | |
| | | D6002 | HZ30-2L-T2 | ZENER DIODE | |
| | | | or HZ30-2LTD | Z DIODE (M) | |
| | | D6551 | MTZJ10B | ZENER DIODE | |
| | | D7002 | RD9.1ES/B2/-T2 | ZENER DIODE | |
| | | | or UZ9.1BSB | ZENER DIODE | |
| | | | or MTZJ9.1B | ZENER DIODE | |
| | | R1 | NRSA02J-682X | MG RESISTOR | 6.8kΩ,1/10W |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|
| | | R2 | NRSA02J-152X | MG RESISTOR | 1.5kΩ,1/10W |
| | | R3 | NRSA02J-822X | MG RESISTOR | 8.2kΩ,1/10W |
| | | R6 | NRSA02J-273X | MG RESISTOR | 27kΩ,1/10W |
| | | R7 | NRSA02J-821X | MG RESISTOR | 820Ω,1/10W |
| | | R8 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | R9 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | R12 | QRE141J-0R0Y | RESISTOR | 0Ω,1/4W |
| | | R37 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | R46 | NRSA02J-331X | MG RESISTOR | 330Ω,1/10W |
| | | R49 | NRSA02J-561X | MG RESISTOR | 560Ω,1/10W |
| | | R66 | QRE141J-104Y | RESISTOR | 100kΩ,1/4W |
| | | R77 | QRE141J-103Y | RESISTOR | 10kΩ,1/4W |
| | | R90 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | | R92 | NRSA02J-392X | MG RESISTOR | 3.9kΩ,1/10W |
| | | R93 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| | | R104 | NRSA02J-562X | MG RESISTOR | 5.6kΩ,1/10W |
| | | R106 | NRSA02J-225X | MG RESISTOR | 2.2MΩ,1/10W |
| | | R107 | QRE141J-225Y | RESISTOR,A.B.E.F | 2.2MΩ,1/4W |
| | | R109 | QRE141J-225Y | RESISTOR | 2.2MΩ,1/4W |
| | | R201 | NRSA02J-332X | MG RESISTOR | 3.3kΩ,1/10W |
| | | R202 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| | | R901 | NRSA02J-750X | MG RESISTOR | 75Ω,1/10W |
| | | R904 | QRE123J-331X | RESISTOR | 330Ω,1/2W |
| | | R905 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| | | R911 | NRSA02J-750X | MG RESISTOR | 75Ω,1/10W |
| | | R912 | NRSA02J-750X | MG RESISTOR | 75Ω,1/10W |
| | | R2001 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| | | R2003 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| | | R2004 | NRSA02J-332X | MG RESISTOR | 3.3kΩ,1/10W |
| | | R2005 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | | R2006 | NRSA02J-393X | MG RESISTOR | 39kΩ,1/10W |
| | | R2007 | NRSA02J-393X | MG RESISTOR,A.B.E.F | 39kΩ,1/10W |
| | | R2009 | NRSA02J-123X | MG RESISTOR | 12kΩ,1/10W |
| | | R2010 | NRSA02J-123X | MG RESISTOR,A.B.E.F | 12kΩ,1/10W |
| | | R2012 | NRSA02J-153X | MG RESISTOR | 15kΩ,1/10W |
| | | R2013 | NRSA02J-682X | MG RESISTOR | 6.8kΩ,1/10W |
| | | R2014 | NRSA02J-224X | MG RESISTOR | 220kΩ,1/10W |
| | | R2015 | NRSA02J-181X | MG RESISTOR | 180Ω,1/10W |
| | | R2016 | NRSA02J-473X | MG RESISTOR | 47kΩ,1/10W |
| | | R2017 | NRSA02J-153X | MG RESISTOR | 15kΩ,1/10W |
| | | R2018 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | | R2019 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | | R2053 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | | R2054 | NRSA02J-123X | MG RESISTOR | 12kΩ,1/10W |
| | | R2055 | NRSA02J-3R3X | MG RESISTOR | 3.3Ω,1/10W |
| | | R2056 | NRSA02J-820X | MG RESISTOR | 82Ω,1/10W |
| | | R2057 | NRSA02J-473X | MG RESISTOR | 47kΩ,1/10W |
| | | R2058 | NRSA02J-183X | MG RESISTOR | 18kΩ,1/10W |
| | | R2059 | NRSA02J-473X | MG RESISTOR | 47kΩ,1/10W |
| | | R2060 | NRSA02J-183X | MG RESISTOR | 18kΩ,1/10W |
| | | R2201 | NRSA02J-680X | MG RESISTOR | 68Ω,1/10W |
| | | R2206 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| | | R2207 | NRSA02J-332X | MG RESISTOR | 3.3kΩ,1/10W |
| | | R2217 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | | R2218 | NRSA02J-393X | MG RESISTOR | 39kΩ,1/10W |
| | | R2219 | NRSA02J-393X | MG RESISTOR,A.B.E.F | 39kΩ,1/10W |
| | | R2223 | NRSA02J-123X | MG RESISTOR | 12kΩ,1/10W |
| | | R2224 | NRSA02J-123X | MG RESISTOR,A.B.E.F | 12kΩ,1/10W |
| | | R2232 | NRSA02J-680X | MG RESISTOR | 68Ω,1/10W |
| | | R2251 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | | R2601 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |

| ⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| R2603 | NRSA02J-101X | MG RESISTOR,A.B.E.F | 100Ω,1/10W |
| R3001 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3002 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3003 | NRSA02J-102X | MG RESISTOR,A.B.E.F | 1kΩ,1/10W |
| R3005 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3007 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3008 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3013 | NRSA02J-102X | MG RESISTOR,A.B.E.F | 1kΩ,1/10W |
| R3015 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3016 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3017 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| R3018 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| R3021 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3022 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3026 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3027 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3029 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3030 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3031 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3035 | QRE141J-102Y | RESISTOR | 1kΩ,1/4W |
| R3043 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3046 | QRE141J-102Y | RESISTOR | 1kΩ,1/4W |
| R3060 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3079 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3081 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3082 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3083 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3084 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3085 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| R3086 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3090 | QRE141J-102Y | RESISTOR | 1kΩ,1/4W |
| R3092 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3094 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3096 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3097 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3098 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| R3099 | NRSA02J-102X | MG RESISTOR,E.F | 1kΩ,1/10W |
| R3100 | NRSA02J-102X | MG RESISTOR,E.F | 1kΩ,1/10W |
| R3201 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3202 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| R3203 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3204 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| R3205 | NRSA02J-562X | MG RESISTOR | 5.6kΩ,1/10W |
| R3206 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3207 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3208 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3209 | QRE141J-181Y | RESISTOR | 180Ω,1/4W |
| R3210 | NRSA02J-183X | MG RESISTOR | 18kΩ,1/10W |
| R3211 | NRSA02J-183X | MG RESISTOR | 18kΩ,1/10W |
| R3212 | NRSA02J-181X | MG RESISTOR | 180Ω,1/10W |
| R3213 | NRSA02J-273X | MG RESISTOR | 27kΩ,1/10W |
| R3214 | NRSA02J-181X | MG RESISTOR | 180Ω,1/10W |
| R3215 | NRSA02J-273X | MG RESISTOR | 27kΩ,1/10W |
| R3216 | NRSA02J-474X | MG RESISTOR | 470kΩ,1/10W |
| R3217 | NRSA02J-334X | MG RESISTOR | 330kΩ,1/10W |
| R3219 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3220 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| R3222 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| R3223 | NRSA02J-105X | MG RESISTOR | 1MΩ,1/10W |
| R3224 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| R3226 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |

| # ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | R3227 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R3232 | QRE141J-104Y | RESISTOR | 100kΩ,1/4W |
| | R3233 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | R3234 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | R3236 | NRS181J-103X | MG RESISTOR,A.B.E.F | 10kΩ,1/8W |
| | R3237 | QRE141J-472Y | RESISTOR | 4.7kΩ,1/4W |
| | R3238 | QRE141J-472Y | RESISTOR | 4.7kΩ,1/4W |
| | R3240 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R3241 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R4001 | QRE141J-222Y | RESISTOR | 2.2kΩ,1/4W |
| | R4002 | NRSA02J-223X | MG RESISTOR | 22kΩ,1/10W |
| | R4003 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| | R4004 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | R4006 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | R4010 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | R4011 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | R4012 | NRSA02J-153X | MG RESISTOR | 15kΩ,1/10W |
| | R4018 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R4019 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R4020 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R4021 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R4022 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| | R4024 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | R4025 | NRSA02J-472X | MG RESISTOR | 4.7kΩ,1/10W |
| ⚠ | R5001 | QRZ9046-475Z | RESISTOR | 4.7MΩ,1/2W |
| | R5101 | QRE141J-224Y | RESISTOR | 220kΩ,1/4W |
| | R5102 | QRE141J-224Y | RESISTOR | 220kΩ,1/4W |
| | R5103 | QRE141J-683Y | RESISTOR | 68kΩ,1/4W |
| | R5104 | QRG02GJ-683 | OMF RESISTOR | 68kΩ,2W |
| | R5106 | QRT01DJ-R39X | MF RESISTOR | 0.39Ω,1W |
| | R5107 | QRE121J-331Y | RESISTOR | 330Ω,1/2W |
| | R5108 | NRSA02J-152X | MG RESISTOR | 1.5kΩ,1/10W |
| | R5109 | QRE141J-681Y | RESISTOR | 680Ω,1/4W |
| | R5110 | NRSA02J-224X | MG RESISTOR | 220kΩ,1/10W |
| | R5302 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R5303 | NRSA02J-122X | MG RESISTOR | 1.2kΩ,1/10W |
| ⚠ | R5304 | QRZ9005-221X | FUSI RESISTOR | 220Ω,1/4W |
| | R5305 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | R5306 | NRSA02J-823X | MG RESISTOR | 82kΩ,1/10W |
| | R5327 | NRSA02J-303X | MG RESISTOR | 30kΩ,1/10W |
| | R6020 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R6021 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R6022 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R6030 | NRSA02J-332X | MG RESISTOR | 3.3kΩ,1/10W |
| | R6032 | NRSA02J-123X | MG RESISTOR | 12kΩ,1/10W |
| | R6033 | NRSA02J-123X | MG RESISTOR | 12kΩ,1/10W |
| | R6053 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R6501 | NRSA02J-102X | MG RESISTOR | 1kΩ,1/10W |
| | R6502 | NRSA02J-334X | MG RESISTOR | 330kΩ,1/10W |
| | R6503 | NRSA02J-124X | MG RESISTOR | 120kΩ,1/10W |
| | R6504 | NRSA02J-302X | MG RESISTOR | 3kΩ,1/10W |
| | R6505 | NRSA02J-512X | MG RESISTOR | 5.1kΩ,1/10W |
| | R6506 | NRSA02J-333X | MG RESISTOR | 33kΩ,1/10W |
| | R6507 | NRSA02J-333X | MG RESISTOR | 33kΩ,1/10W |
| | R6508 | NRSA02J-392X | MG RESISTOR | 3.9kΩ,1/10W |
| | R6509 | NRSA02J-122X | MG RESISTOR | 1.2kΩ,1/10W |
| | R6510 | NRSA02J-392X | MG RESISTOR | 3.9kΩ,1/10W |
| | R6511 | NRSA02J-122X | MG RESISTOR | 1.2kΩ,1/10W |
| | R6514 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | R6515 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | R6551 | NRSA02J-271X | MG RESISTOR | 270Ω,1/10W |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|
| | | R6552 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| | | R7001 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | | R7002 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | | R7003 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | | R7004 | NRSA02J-471X | MG RESISTOR | 470Ω,1/10W |
| | | R7005 | QRE141J-103Y | RESISTOR,E.F | 10kΩ,1/4W |
| | | R7006 | NRSA02J-103X | MG RESISTOR,E.F | 10kΩ,1/10W |
| | | R7007 | NRSA02J-103X | MG RESISTOR,E.F | 10kΩ,1/10W |
| | | R7008 | NRSA02J-103X | MG RESISTOR,E.F | 10kΩ,1/10W |
| | | R7013 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | | R7014 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | R7017 | QRE141J-103Y | RESISTOR | 10kΩ,1/4W |
| | | R7020 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | | R7021 | NRSA02J-122X | MG RESISTOR | 1.2kΩ,1/10W |
| | | R7022 | NRSA02J-182X | MG RESISTOR | 1.8kΩ,1/10W |
| | | R7023 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| | | R7024 | NRSA02J-272X | MG RESISTOR | 2.7kΩ,1/10W |
| | | R7025 | NRSA02J-472X | MG RESISTOR,C.D.E.F | 4.7kΩ,1/10W |
| | | R7030 | NRSA02J-103X | MG RESISTOR | 10kΩ,1/10W |
| | | R7031 | NRSA02J-122X | MG RESISTOR | 1.2kΩ,1/10W |
| | | R7032 | NRSA02J-182X | MG RESISTOR | 1.8kΩ,1/10W |
| | | R7033 | NRSA02J-222X | MG RESISTOR | 2.2kΩ,1/10W |
| | | R7034 | NRSA02J-0R0X | MG RESISTOR,A.B.C.D | 0Ω,1/10W |
| | | | NRSA02J-272X | MG RESISTOR,E.F | 2.7kΩ,1/10W |
| | | R7035 | NRSA02J-472X | MG RESISTOR,E.F | 4.7kΩ,1/10W |
| | | R7036 | NRSA02J-682X | MG RESISTOR,E.F | 6.8kΩ,1/10W |
| | | R7037 | NRSA02J-563X | MG RESISTOR | 56kΩ,1/10W |
| | | R7044 | QRE141J-472Y | RESISTOR | 4.7kΩ,1/4W |
| | | R7202 | NRSA02J-471X | MG RESISTOR,A.B.E.F | 470Ω,1/10W |
| | | R7203 | NRSA02J-222X | MG RESISTOR,A.B.E.F | 2.2kΩ,1/10W |
| | | R7204 | QRE123J-100X | RESISTOR,A.B.E.F | 10Ω,1/2W |
| | | C1 | NCB21AK-105X | CAPACITOR | 1μF,10V |
| | | C2 | NCB21AK-105X | CAPACITOR | 1μF,10V |
| | | C3 | NCB21AK-105X | CAPACITOR | 1μF,10V |
| | | C4 | NCB21AK-105X | CAPACITOR | 1μF,10V |
| | | C5 | QEKJ1CM-476 | E CAPACITOR | 47μF,16V |
| | | C6 | NCB11EK-104X | CAPACITOR | 0.1μF,25V |
| | | C7 | NCB21HK-471X | CAPACITOR | 470pF,50V |
| | | C8 | NCB21EK-473X | CAPACITOR | 0.047μF,25V |
| | | C9 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | | C10 | NDC21HJ-151X | CAPACITOR | 150pF,50V |
| | | C11 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C12 | NDC21HJ-330X | CAPACITOR | 33pF,50V |
| | | C13 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | | C14 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C15 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C16 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C17 | QEKJ1HM-335 | E CAPACITOR | 3.3μF,50V |
| | | C18 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | | C19 | QEKJ1HM-225 | E CAPACITOR | 2.2μF,50V |
| | | C20 | QEPF1HM-105 | NP E CAPACITOR | 1μF,50V |
| | | C21 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C22 | QEKJ0JM-476 | E CAPACITOR | 47μF,6.3V |
| | | C23 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C24 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C25 | NDC21HJ-5R0X | CAPACITOR | 5pF,50V |
| | | C26 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C27 | NCB21HK-223X | CAPACITOR | 0.022μF,50V |
| | | C28 | QEKJ1HM-335 | E CAPACITOR | 3.3μF,50V |
| | | C29 | NCB21HK-472X | CAPACITOR | 0.0047μF,50V |
| | | C30 | QEKJ1HM-474 | E CAPACITOR | 0.47μF,50V |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|
| | | C31 | QEKJ0JM-476 | E CAPACITOR | 47μF,6.3V |
| | | C32 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | | C33 | QEKJ1HM-225 | E CAPACITOR | 2.2μF,50V |
| | | C34 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C35 | NCB21EK-333X | CAPACITOR | 0.033μF,25V |
| | | C36 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C37 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C38 | QEKJ0JM-476 | E CAPACITOR | 47μF,6.3V |
| | | C39 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C40 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C51 | QERF1HM-105 | E CAPACITOR | 1μF,50V |
| | | C54 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | C56 | NCB21CK-474X | CAPACITOR | 0.47μF,16V |
| | | C62 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C64 | NDC21HJ-9R0X | CAPACITOR | 9pF,50V |
| | | C81 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | | C106 | NCB21HK-102X | CAPACITOR | 0.001μF,50V |
| | | C109 | NCB21HK-223X | CAPACITOR | 0.022μF,50V |
| | | C110 | NCB21HK-331X | CAPACITOR | 330pF,50V |
| | | C201 | QEKJ0JM-107 | E CAPACITOR | 100μF,6.3V |
| | | C202 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C203 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | | C205 | NDC21HJ-101X | CAPACITOR | 100pF,50V |
| | | C207 | NCF21CZ-105X | CAPACITOR | 1μF,16V |
| | | C208 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | C210 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | | C901 | QETN0JM-477 | E CAPACITOR | 470μF,6.3V |
| | | C903 | QEKJ1CM-476 | E CAPACITOR | 47μF,16V |
| | | C904 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | | C2001 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2002 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2003 | QEKC0JM-476 | E CAPACITOR | 47μF,6.3V |
| | | C2005 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2006 | NCB21HK-123X | CAPACITOR | 0.012μF,50V |
| | | C2007 | QEKJ1CM-226 | E CAPACITOR | 22μF,16V |
| | | C2008 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2009 | NCB21HK-102X | CAPACITOR | 0.001μF,50V |
| | | C2010 | NCB21HK-222X | CAPACITOR | 0.0022μF,50V |
| | | C2011 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2012 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2051 | QCBB1HJ-331 | CAPACITOR | 330pF,50V |
| | | C2052 | QFV91HJ-823 | F CAPACITOR | 0.082μF,50V |
| | | C2053 | NCB21HK-472X | CAPACITOR | 0.0047μF,50V |
| | | C2054 | NCB21HK-223X | CAPACITOR | 0.022μF,50V |
| | | C2055 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2201 | NCB21CK-104X | CAPACITOR | 0.1μF,16V |
| | | C2202 | NCB21EK-333X | CAPACITOR | 0.033μF,25V |
| | | C2203 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2204 | NCB21HK-102X | CAPACITOR | 0.001μF,50V |
| | | C2205 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | | C2206 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2207 | QEKJ1CM-476 | E CAPACITOR | 47μF,16V |
| | | C2208 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2215 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2217 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2219 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | | C2220 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| | | C2221 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | | C2222 | QEKJ1HM-474 | E CAPACITOR | 0.47μF,50V |
| | | C2223 | QEKJ1HM-474 | E CAPACITOR | 0.47μF,50V |
| | | C2224 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |

| REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| C2225 | QEKJ1EM-475 | E CAPACITOR | 4.7μF,25V |
| C2226 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| C2227 | NCB21CK-104X | CAPACITOR | 0.1μF,16V |
| C2251 | QEKC0JM-476 | E CAPACITOR | 47μF,6.3V |
| C2252 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C2253 | NCB21CK-104X | CAPACITOR | 0.1μF,16V |
| C2254 | NCB21CK-104X | CAPACITOR | 0.1μF,16V |
| C3001 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| C3002 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| C3003 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| C3008 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3013 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| C3016 | NDC21HJ-180X | CAPACITOR | 18pF,50V |
| C3017 | NDC21HJ-220X | CAPACITOR | 22pF,50V |
| C3019 | NDC21HJ-180X | CAPACITOR | 18pF,50V |
| C3020 | NDC21HJ-180X | CAPACITOR | 18pF,50V |
| C3022 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3023 | NCF21CZ-105X | CAPACITOR | 1μF,16V |
| C3024 | QEKJ0JM-476 | E CAPACITOR | 47μF,6.3V |
| C3025 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3028 | QETN0JM-108 | E CAPACITOR | 1000μF,6.3V |
| C3029 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3030 | QEKJ0JM-227 | E CAPACITOR | 220μF,6.3V |
| C3035 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| C3036 | QERF0JM-107 | E CAPACITOR | 100μF,6.3V |
| C3048 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3049 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3050 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3051 | NCF11HZ-103X | CAPACITOR | 0.01μF,50V |
| C3052 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| C3053 | QDYB1CM-103Y | CAPACITOR | 0.01μF,16V |
| C3055 | QEKJ0JM-337 | E CAPACITOR | 330μF,6.3V |
| C4001 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| C4002 | QEKJ1HM-224 | E CAPACITOR | 0.22μF,50V |
| C4004 | QERF0JM-336 | E CAPACITOR | 33μF,6.3V |
| C4006 | NCB21EK-563X | CAPACITOR | 0.056μF,25V |
| C4007 | NCB21HJ-103X | CAPACITOR | 0.01μF,50V |
| C4008 | QERF0JM-476 | E CAPACITOR | 47μF,6.3V |
| C4009 | NCB21HK-102X | CAPACITOR | 0.001μF,50V |
| C4010 | QERF0JM-476 | E CAPACITOR | 47μF,6.3V |
| C4011 | NCB21CK-224X | CAPACITOR | 0.22μF,16V |
| C4012 | NDC21HJ-471X | CAPACITOR | 470pF,50V |
| C4014 | NDC21HJ-101X | CAPACITOR | 100pF,50V |
| C4015 | NDC21HJ-101X | CAPACITOR | 100pF,50V |
| C4016 | QEKJ0JM-476 | E CAPACITOR | 47μF,6.3V |
| C4017 | NCB21HJ-103X | CAPACITOR | 0.01μF,50V |
| C4019 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| C4022 | NDC21HJ-101X | CAPACITOR | 100pF,50V |
| C5001 | QFZ9073-683 | F CAPACITOR | 0.068μF,250V |
| C5004 | QCZ9094-472 | CAPACITOR | 0.0047μF,250V |
| C5006 | QETM2DM-826 | E CAPACITOR | 82μF,200V |
| C5101 | QCZ0212-472 | CAPACITOR | 0.0047μF,1kV |
| C5102 | QCZ0302-330Z | CAPACITOR | 33pF,1kV |
| C5104 | QETN1HM-105 | E CAPACITOR | 1μF,50V |
| C5105 | QFN31HJ-183 | F CAPACITOR | 0.018μF,50V |
| C5107 | QFV91HJ-104 | F CAPACITOR | 0.1μF,50V |
| C5201 | QEMU0JM-227 | E CAPACITOR | 220μF,6.3V |
| C5202 | QEMT1CM-827 | E CAPACITOR | 820μF,16V |
| C5203 | QEMT1AM-687 | E CAPACITOR | 680μF,10V |
| C5204 | QETN2AM-475 | E CAPACITOR | 4.7μF,100V |
| C5205 | QETN1HM-106 | E CAPACITOR | 10μF,50V |

| # | ⚠ REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|
| | C5207 | QETN1CM-227 | E CAPACITOR | 220μF,16V |
| | C5208 | QETN1AM-227 | E CAPACITOR | 220μF,10V |
| | C5301 | QEMU0JM-227 | E CAPACITOR | 220μF,6.3V |
| | C5302 | QETN1HM-106 | E CAPACITOR | 10μF,50V |
| | C5303 | QETN1CM-107 | E CAPACITOR | 100μF,16V |
| | C5304 | QFLC1HJ-823Z | F CAPACITOR | 0.082μF,50V |
| | C5305 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | C5310 | QFLC1HJ-393Z | F CAPACITOR | 0.039μF,50V |
| | C6008 | NDC21HJ-100X | CAPACITOR | 10pF,50V |
| | C6013 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | C6023 | NRSA02J-0R0X | MG RESISTOR | 0Ω,1/10W |
| | C6031 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | C6501 | QERF1CM-226 | E CAPACITOR | 22μF,16V |
| | C6502 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | C6503 | QERF1HM-105 | E CAPACITOR | 1μF,50V |
| | C6504 | QERF1EM-475 | E CAPACITOR | 4.7μF,25V |
| | C6505 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | C6506 | QERF1HM-104 | E CAPACITOR | 0.1μF,50V |
| | C6507 | NCB21EK-473X | CAPACITOR | 0.047μF,25V |
| | C6508 | QERF1HM-474 | E CAPACITOR | 0.47μF,50V |
| | C6509 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | C6510 | QERF1HM-105 | E CAPACITOR | 1μF,50V |
| | C6511 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | C6512 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | C6513 | QEE81CJ-335 | T CAPACITOR | 3.3μF,16V |
| | C6514 | QEE81CJ-106 | T CAPACITOR | 10μF,16V |
| | C6515 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | C6516 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | C6517 | QEKJ1CM-106 | E CAPACITOR | 10μF,16V |
| | C6518 | QEKJ1HM-105 | E CAPACITOR | 1μF,50V |
| | C7001 | QDGB1HK-102Y | CAPACITOR | 0.001μF,50V |
| | C7002 | QEKJ1HM-106 | E CAPACITOR | 10μF,50V |
| | C7007 | QEKJ0JM-107 | E CAPACITOR | 100μF,6.3V |
| | C7008 | NCF21CZ-105X | CAPACITOR | 1μF,16V |
| | C7009 | NDC21HJ-220X | CAPACITOR | 22pF,50V |
| | C7010 | NCB21EK-104X | CAPACITOR | 0.1μF,25V |
| | C7011 | QEKJ0JM-227 | E CAPACITOR | 220μF,6.3V |
| | C7013 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | C7014 | NCB21HK-103X | CAPACITOR | 0.01μF,50V |
| | C7019 | NCB21EK-223X | CAPACITOR | 0.022μF,25V |
| | C7206 | QETF0JM-227 | E CAPACITOR,A.B.E.F | 220μF,6.3V |
| | L1 | QQL29BJ-100Z | COIL | 10μH |
| | L2 | QQL29BJ-101Z | COIL | 100μH |
| | L3 | QQL29BJ-100Z | COIL | 10μH |
| | L4 | QQL29BJ-100Z | COIL | 10μH |
| | L5 | QQL29BJ-100Z | COIL | 10μH |
| | L11 | QQL01BJ-120Z | COIL | 12μH |
| | L13 | QQL231J-101Y | COIL | 100μH |
| | L24 | QQL231J-180Y | COIL | 18μH |
| | L28 | QQL231J-150Y | COIL | 15μH |
| | L201 | QQL29BJ-100Z | COIL | 10μH |
| | L203 | QQL231J-4R7Y | COIL | 4.7μH |
| | L901 | QQL29BJ-100Z | COIL | 10μH |
| | L2251 | QQL29BJ-100Z | COIL | 10μH |
| | L5201 | PELN1184 | COIL | 33μH |
| | L5202 | PELN1184 | COIL | 33μH |
| | L7201 | QQL29BJ-101Z | COIL,A.B.E.F | 100μH |
| | X2 | QAX0575-001 | CRYSTAL RESONATOR | |
| | X3001 | QAX0526-001Z | CRYSTAL RESONATOR | |
| | X3002 | QAX0444-001 | CRYSTAL RESONATOR | |
| | S3001 | QSW0602-004 | PUSH SWITCH | |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|
| | | S6050 | QSW0460-001 | SLIDE SWITCH | |
| | | S7001 | QSW0456-002Z | TACT SWITCH,POWER | |
| | | S7002 | QSW0456-002Z | TACT SWITCH,MENU | |
| | | S7004 | QSW0456-002Z | TACT SWITCH,CH- | |
| | | S7006 | QSW0456-002Z | TACT SWITCH,CH+ | |
| | | S7008 | QSW0456-002Z | TACT SWITCH,REVIEW,C.D | |
| | | | QSW0456-002Z | TACT SWITCH,PLAY,E.F | |
| | | S7010 | QSW0456-002Z | TACT SWITCH,SP/EP | |
| | | S7011 | QSW0456-002Z | TACT SWITCH,REC | |
| | | S7013 | QSW0456-002Z | TACT SWITCH,STOP/EJECT | |
| | | S7015 | QSW0456-002Z | TACT SWITCH,PAUSE | |
| | | S7016 | QSW0456-002Z | TACT SWITCH,OK | |
| | | S7021 | QSW0522-002Z | TACT SWITCH,REW,A.B.C.D | |
| | | S7022 | QSW0522-002Z | TACT SWITCH,FF,A.B.C.D | |
| | | S7023 | QSW0456-002Z | TACT SWITCH,PLAY,A.B.C.D | |
| | | K2251 | NQR0007-001X | FERRITE BEAD | |
| | | K2252 | NQR0007-001X | FERRITE BEAD | |
| | | K2253 | NQR0007-001X | FERRITE BEAD | |
| | | K5101 | QQR0678-001Z | FERRITE BEAD | |
| | | PC3001 | GP3S123 | IC(PHOTO SENSOR) | |
| | | PC3002 | GP3S123 | IC(PHOTO SENSOR) | |
| | ⚠ | PC5101 | PS2501-1 | PH COUPLER | |
| | | T2051 | PELN0832 | OSC TRANSFORMER | |
| | ⚠ | T5001 | QQS0031-002 | SW TRANSFORMER | |
| | ⚠ | TB1 | LP20316-001B | TERMINAL BOARD,A.B.E.F | |
| | ⚠ | | PQ21910-3-5 | TERMINAL BOARD,C.D | |
| | | TU6001 | QAU0142-002 | TUNER | |
| | | ET1 | PQ21623-2-5 | EARTH PLATE(RF) | |
| | | DI7001 | QLF0031-001 | FL TUBE | |
| | | HD1 | PQ35479-1-4 | HOLDER(FDP),DI7001 | |
| | | FC5001 | QNG0006-001Z | FUSE CLIP | |
| | | FC5002 | QNG0006-001Z | FUSE CLIP | |
| | | FW3001 | QUM022-13A4A4 | PARA RIBON WIRE,A.B.E.F | |
| | | FW3002 | QUM022-30A4A4 | PARA RIBON WIRE,A.B.E.F | |
| | | SD1 | LP30644-001A | SHIELD CASE(PRE) | |
| | | J1 | QNN0285-002 | PIN JACK,A/V IN,A.B.E.F | |
| | | J2 | QNN0286-002 | PIN JACK,A/V OUT | |
| | | J7101 | QNN0287-001 | PIN JACK,FRONT IN,C.D | |
| | | | QNN0288-001 | PIN JACK,FRONT IN,A.B.E.F | |
| | ⚠ | LF5002 | QQR0516-001 | LINE FILTER | |
| | ⚠ | SG5001 | QAF0046-242Z | SURGE ABSORBER | |
| | ⚠ | VA5001 | QAF0023-431Z | VARISTOR | |
| | ⚠ | VA5002 | QAF0023-431Z | VARISTOR | |
| | | CN1 | QGF1028C1-11 | FPC CONNECTOR,(1-11)U.DRUM | |
| | | CN2001 | QGF1207C1-07 | FPC CONNECTOR,(1-7)A/C HEAD | |
| | | CN2002 | QGB2532J1-02 | CONNECTOR,(1-2)FE HEAD | |
| | | CN3001 | QGB2015M2-08 | CONNECTOR,(1-8)CAP.MOTOR | |
| | | CN3002 | QGF1207C1-05 | FPC CONNECTOR,(1-5)DRUM MDA | |
| | | CN3003 | QGB2532J1-02 | CONNECTOR,(1-2)L.MOTOR | |
| | | CN3004 | QGB2534J2-04 | CONNECTOR,(1-4)R.ENCODER | |
| | ⚠ | CN5001 | QGA7901C3-02 | CONNECTOR,(1-2)AC IN | |
| | | CN7001 | QGF1207C1-09 | FPC CONNECTOR,(1-9)MINI FRONT,A.B.C.D | |
| | | | QGF1207C1-09 | FPC CONNECTOR,(1-9)SHUTTLE,E.F | |
| | ⚠ | CP4001 | ICP-N25 | CIRCUIT PROTECTOR | |
| | ⚠ | CP5302 | ICP-N25 | CIRCUIT PROTECTOR | |
| | ⚠ | F5001 | QMF51N2-1R25J1 | FUSE | 1.25A,AC250V |

| # | ⚠ | REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|---|---|

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## R.PAUSE BOARD ASSEMBLY(MODEL:A.B.E.F)<06>

| REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| PW2 | LPA10088-01A2 | REMOTE PAUSE BOARD ASSY | |
| R7156 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| J7104 | PU60612 | MINI JACK | |

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## AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

| REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| PW1 | LPA10010-01A1 | A/C HEAD BOARD ASSY |
| CN1 | QGF1208F1-07 | FPC CONNECTOR |

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## MINI FRONT BOARD ASSEMBLY(MODEL:A.B.C.D) <28>

| REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| PW6 | LPA10088-01C6 | MINI FRONT BOARD ASSY | |
| R7043 | QRE141J-272Y | RESISTOR | 2.7kΩ,1/4W |
| R7044 | QRE141J-472Y | RESISTOR | 4.7kΩ,1/4W |
| R7045 | QRE141J-682Y | RESISTOR | 6.8kΩ,1/4W |
| S7021 | QSW0456-002Z | TACT SWITCH,REW | |
| CN7002 | QGF1208C1-09 | FPC CONNECTOR,(1-9)MAIN | |

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## LOADING MOTOR BOARD ASSEMBLY <55>

| REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| PW2 | LPA10010-01A2 | LOADING MOTOR BOARD ASSY |
| CN1 | QGB2533K1-02 | CONNECTOR |

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## SHUTTLE BOARD ASSEMBLY(MODEL:E.F)<85>

| REF No. | PART No. | PART NAME, DESCRIPTION |
|---|---|---|
| PW1 | LPA20006-01A | SHUTTLE BOARD ASSY |
| UN7001 | QSW0845-001 | JOG SHUTTLE SW |
| CN7008 | QGF1209F1-09 | FPC CONNECTOR(1-9) |

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## C.BOX CTL BOARD ASSEMBLY(MODEL:A.B.E.F) <92>

| REF No. | PART No. | PART NAME, DESCRIPTION | |
|---|---|---|---|
| PW3 | LPA10088-01A3 | C.BOX BOARD ASSY | |
| R7155 | NRSA02J-101X | MG RESISTOR | 100Ω,1/10W |
| J7105 | PU60612 | MINI JACK | |